



KENTUCKY LEAD POISONING PREVENTION PROGRAM

Case Management Plan

2010

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Case Management Plan

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* Prenatal Section of the PHPR

Introduction

Every child deserves the best opportunity to succeed.

Background & Purpose

Since 1974, an effort to prevent, screen, diagnose, and treat **LEAD POISONING** has been under way as part of the Kentucky Revised Statute (KRS), including the identification of the sources of lead poisoning through research, educational, epidemiological, and clinical activities as is necessary. In addition, **BLOOD LEAD SCREENING** and **CASE MANAGEMENT** protocols and guidelines have been published in the *Kentucky Public Health Practice Reference (PHPR)*, which contains detailed clinically based information to support patient-centered health care provided by local health departments and supportive information to assist professionals in providing services within the community, outside the clinical setting.¹ Until recently, however, there has been no means of assuring that children statewide receive appropriate services after they are diagnosed with an elevated blood lead level (EBLL) level (10µg/dL or greater). By early 2001, the need for more expanded and standardized statewide protocols became apparent. An assessment was conducted and found that each year nearly 20,000 children were being screened for lead poisoning through local health department clinics and private providers. Of those children who required confirmatory testing (20µg/dL or greater), less than 50.0% actually received a confirmation test; and of those children who received a confirmatory test, 30.5% were confirmed as lead poisoned. Further, according to state statute, all **AT RISK CHILDREN** ages 72 months and under should be tested for elevated blood lead levels. It was subsequently concluded that only 10.0% of all children aged 1-2 years and 6.0% of children age 72 months and under over all were being tested statewide. It was therefore determined that a more comprehensive approach was needed for testing and follow up activities assuring that (1) all at risk children are tested for EBLL's; and (2) children statewide receive appropriate and case managed services after they are diagnosed with an EBLL defined as 10µg/dL or greater of whole blood. On July 1, 2003 the Commonwealth of Kentucky was successful in creating the Kentucky Lead Poisoning

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Prevention Program, funded by a grant provided by the U.S. Centers for Disease Control and Prevention, to address these issues.

The case management guidelines outlined in this document are a result of this early assessment and a response to the identified need for more comprehensive and standardized statewide guidance in this area. Changes have been made as needed, based on evaluation results and a more thorough investigation by a designated team assembled from the **STATEWIDE ADVISORY WORKGROUP**. These guidelines are intended to serve as minimum case management guidelines for providing services to children with EBLL's 10µg/dL or greater. These have been developed to establish minimum levels of care and are not intended to limit the level of care provided at the local health department. Those local jurisdictions that are formally a part of the statewide lead poisoning prevention effort and have, therefore, greater resources available should take a more rigorous approach to case management. This document works in concert with the Kentucky Lead Poisoning Prevention Program Statewide Screening Plan Guidance (Section I) and follows the recommendations from the Centers for Disease Control and Prevention Advisory Committee on Childhood Lead Poisoning Prevention.² Current case management documents and guidelines published in the Public Health Practice Reference have been incorporated and expanded to more fully address follow up activity issues and as a means to create a standardized process for which to conduct screening and case management activities in the Commonwealth of Kentucky toward the elimination of blood lead levels 10µg/dL or greater among children up to 72 months of age in accordance with the Cabinet for Health and Family Services (CHFS) *Healthy People 2010*³ target.

A final objective of these guidelines is to ensure that a qualified **CASE MANAGER**, or appropriately qualified designee, is available to oversee the treatment and recovery of each child who has been diagnosed with an elevated blood lead level, and to ensure that steps are taken to prevent further exposure of the child to potential sources of lead within a seamless program structure including blood lead screening, environmental assessment and remediation.

In December 2010 this plan was reviewed and updated to reflect changes in the *Public Health Practice Reference (PHPR)*. It is reviewed and updated biannually by the *Health Subcommittee* made up of, LHD case managers, LHD program directors, the University of Kentucky Extension Associate for Environmental Issues and the Kentucky CLPPP case manager and environmentalist. It is further reviewed annually by the entire Advisory Committee.

As of December 2010 there are over 400 children from around the state who have a blood lead level of 10µg/dL or above and are being case managed by the Kentucky CLPPP and Local Health Departments.

Identifying children at risk

Identification, assessment and diagnosis

- The primary cause of EBLL's in children up to 72 months of age is exposure to deteriorated paint in housing built before 1950.² Although severe cases of lead poisoning are rare today, the threshold for harmful effects of lead remains



unknown. There is good evidence, however, that show deficits in cognitive and academic skills associated with lead exposure at blood lead concentrations lower than $5\mu\text{g}/\text{dL}$.⁴ In Kentucky, blood lead levels (BLL) $10\mu\text{g}/\text{dL}$ or greater will initiate case management follow up and interventions. BLL's $\geq 15\mu\text{g}/\text{dL}$ requires

CONFIRMATORY TESTING before initiating a more intense management, including physicians medical

evaluations, medical nutrition therapy and environmental assessments starting with the child's home. Environmental assessments are also available to any child with **PERSISTENT** levels in the $10\text{--}14\mu\text{g}/\text{dL}$ range. Referrals and recommendations to the physicians to make a lead specialist consult on BLLs $25\mu\text{g}/\text{dL}$ or greater, for possible **CHELATION THERAPY**. Case management activities associated with each blood lead class are outlined in the *Lead Section* published in the Kentucky Public Health Practice Reference (PHPR). Each blood lead level is detailed on the following pages in this case management plan with appropriate follow up activities are noted in the columns *Interventions* and *Follow-Up*, respectively.

Guidelines for Blood Lead Levels				
Blood Lead	BLOOD LEAD LEVEL	ASSESSMENT	INTERVENTIONS	FOLLOW-UP
	0-9.9µg/dL	Not considered lead poisoning <i>(No amount of lead in the body is normal. Even low blood lead levels can cause adverse neurological effects such as loss of IQ points and learning disabilities. It is very important that education on ways to prevent lead poisoning begin at this level)</i>	<ul style="list-style-type: none"> Continue to review risk assessment questions at each preventive health visit up to 6 years of age with routine blood lead testing at 12 and 24 months on all Medicaid recipients/ and at-risk children who live in a targeted screening area or have positive risk factors. Complete routine blood lead testing for at-risk patients (Medicaid, Targeted Zip Code areas, and "+" or "don't know" verbal lead risk assessment responses Parent education pamphlets Refer for WIC services Contact State HHLPPP NCI if you have questions 	<ul style="list-style-type: none"> Annual blood lead test once a positive risk factor is identified. Retest at next periodicity visit if risk factor changes Medicaid recipients or children who reside in a targeted screening area: <ol style="list-style-type: none"> Routine blood lead level obtained at 12 and 24 months of age. Blood lead level obtained on all children 25 months–6 years of age who have never been screened.
	10–14.9 µg/dL	Level of concern 1 st specimen at this level	<ul style="list-style-type: none"> Parent education pamphlets Mail or fax monthly report to HHLPPP NCI, contact if any questions; send report form if 2nd level in the 12 weeks is >10µg/dL Refer for WIC services <p><u>Home Visits:</u></p> <ul style="list-style-type: none"> If 1st specimen at this level nurse or allied health professional and/or local environmentalist may make home visit and visual investigation *If 2nd BLL remains at this level, nurse and/or local environmentalist *must make a home visit for visual investigation within 30 days of 2nd EBLL result. 	<ul style="list-style-type: none"> Repeat blood lead level in 12 weeks of the initial, if BLL is still in this range repeat every 12 weeks until blood lead level is < 10 µg/dl. Establish a tracking system that assures retesting. Case management.
	15–44.9 µg/dL For BLL > 25, please refer to physician to consult with a lead specialist	Lead Poisoning ≥15µg/dL Venous Specimens are uncontaminated, preferred and considered confirmation First capillary specimen at this level will need to be confirmed 2 nd Capillary is acceptable; however, special care is needed when using a 2 nd capillary specimen as a confirmation for lead poisoning	<ul style="list-style-type: none"> Parent education pamphlets Contact state HHLPPP NCI if guidance needed <p>Once Lead Poisoning is Confirmed:</p> <ul style="list-style-type: none"> Refer for Medical Nutrition Therapy and WIC services. Refer to a primary care provider (PCP) for medical evaluation. Provide PCP with letter/information with lead specialist consult. Initial home visit by nurse or allied health professional within 1 week. Visual investigation to be made within 1 week of LHD receiving confirmed EBLL results by an RN and/ or Environmentalist. Refer to a *Certified Risk Assessor to perform a lead risk assessment within 2 weeks of LHD receiving confirmed EBLL results. <i>*Contact KY HHLPPP if your HD does not have a Certified Risk Assessor</i> Environmental: Lead Risk Assessment to be completed within 30 days of Risk Assessor receiving referral from LHD, 'Environmental' guidance can be found in AR Mail or fax report to HHLPPP NCI 	<ol style="list-style-type: none"> Submit confirmation (see assessment criteria) specimen within one week Repeat blood lead levels at 1–2 month intervals until: <ol style="list-style-type: none"> Blood lead level is less than 10µg/dl for 6 months or as s ordered by the physician Establish a tracking system that assures retesting and case management For medical case closure see case closure section Environmental: Lead hazards have been addressed.

*Consult KY HHLPPP for more information

GUIDELINES FOR BLOOD LEAD LEVELS AND FOLLOW-UP

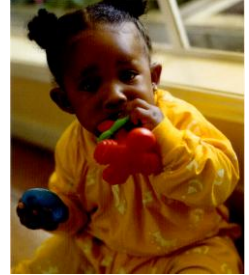
	BLOOD LEAD LEVEL	ASSESSMENT	INTERVENTIONS	FOLLOW-UP
Blood Lead	45–69.9 µg/dL A VENOUS specimen is needed to confirm a diagnosis of lead poisoning at this level.	Lead Poisoning BLL ≥ 15 µg/dL	Same as listed above except refer to PCP for medical evaluation. Provide PCP with letter/information with lead specialist consult within 48 hours.	<ul style="list-style-type: none"> • Submit confirmation (see assessment criteria) specimen within 48 hours • During and post chelation therapy, retest monthly until: • Blood lead level is less than 10µg/dl for 6 months (capillary specimens are acceptable) • or as s ordered by the physician • Establish a tracking system that assures retesting and case management • For medical case closure see case closure section • Environmental: Lead hazards have been addressed
	70µg/dL and above A VENOUS specimen is needed to confirm a diagnosis of lead poisoning at this level.	Lead Poisoning BLL ≥ 15 µg/dL MEDICAL EMERGENCY	Same as listed above except refer to PCP for medical evaluation. Provide PCP with letter/information with lead specialist consult within 24 hours.	<ul style="list-style-type: none"> • Submit confirmation (see assessment criteria) specimen within 24 hours • During and post chelation therapy, retest monthly until: • Blood lead level is less than 10µg/dl for 6 months (capillary specimens are acceptable) • or as s ordered by the physician • Establish a tracking system that assures retesting and case management • For medical case closure see case closure section • Environmental: Lead hazards have been addressed

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The interventions recommended in this *Chart* are for the secondary prevention of elevated blood lead levels, which is to prevent further lead exposure and to reduce BLLs in children who have been identified as having EBLs. It must be stressed that the ultimate goal is ***primary prevention*** – the removal of harmful lead exposure sources in especially older, deteriorated housing, and the elimination of lead from products with which children may come in direct or indirect contact.



Intervention and follow up

The primary objective of the case management process of children with EBLL's is to reduce their BLLs below 10µg/dL— CDC's the level of concern. Ninety percent of programs use professionals (nurses or social workers) to deliver case management services.² A major component in assuring this process is outreach and **CARE COORDINATION**.

Outreach and care coordination

Outreach and care coordination includes home visiting, service planning and resource identification, linkages to needed services, service implementation, monitoring of service delivery, and evaluation.² A case management team may include the case manager, the child's caregiver, the child's PCP, an environmental risk assessor, a health educator, a nutritionist, and a local health agency as well as technical assistance from KY HHLPPP. Once a child is identified with an elevated blood lead level, follow up activities should begin in accordance with *Lead Section (Appendix A)*. In accordance with CDC case management recommendations, case management includes the following:

- Visit the child's residence (and other sites where the child spends 6 hours or more per week).
- Review preventive education with the care giver
- Assess factors that may impact the child's BLL (including sources of lead, nutrition, access to services, family interaction, and caregiver understanding).
- Oversee the activities of the case management team.
- Develop a written plan for intervention.
- Coordinate the implementation of the plan.
- Evaluate compliance with the plan and the success of the plan.

It should be noted that all children with EBLL's become "health department patients" when their cases are brought to the attention of staff, even if the child is receiving services elsewhere.

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Any time the blood lead levels are at 10-14µg/dL, an environmental visual evaluation is completed (*Appendix E & F*). At BLL's level $\geq 15\mu\text{g/dL}$, which is considered lead poisoning, an environmental risk assessment is required. An environmental risk assessment must be performed by an environmentalist certified to do risk assessments. The certified risk assessor should visit the child's residence and any other site where the child spends 6 hours or more per week, with the case manager if possible, to conduct a thorough investigation with samples taken of the site to identify sources of environmental lead exposure. Results from the environmental visual evaluation as well as the environmental risk assessment can be used by the case management team in developing a plan to protect the child until corrective measures are completed and no new hazards are identified.

The PHR Lead Management Home Visit Protocol



In accordance with the Kentucky *Public Health Practice Reference*, an initial home visit by a nurse/case manager is required for all children receiving services in a health department clinic with second blood lead levels of 10-14µg/dL or greater; (*Appendix C & D*). Additional follow-up home visits may be made at the discretion of the nurse/case manager to monitor the blood lead status of the child and/or evaluate the child's residence (*Appendix G & H*).

The nurse/case manager is responsible for initiating a referral to the local health department (LHD) environmentalist for an environmental visual evaluation. The environmental visual evaluation should occur at the same time as the case manager initial home visit if possible. The home visit by the nurse/case manager and the environmentalist visual evaluation should occur according to the timeframe specified in Table 1.



Table 1: Home Visit and Visual Investigation

Blood Lead Level	Time Frame for Assessment
2 nd BLL 10-14µg/dL	4 weeks of 2nd BLL in this range
15-19.9 µg/dL	2 weeks; refer for comprehensive lead risk assessment
20-44.9 µg/dL	1 weeks; refer for comprehensive lead risk assessment
45-69.9 µg/dL	48 hours; refer for comprehensive lead risk assessment
≥ 70 µg/dL	24 hours; refer for comprehensive lead risk assessment

INITIAL ASSESSMENT

- Assess family's awareness of the child being lead poisoned and level of understanding
- Who is providing primary and acute health care?
- Assess child's physical status, including behavior problems/changes, nutritional status and specific habits such as placing fingers in mouth or eating dirt or paint chips.

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- Assess home environment. Determine whether dwelling was built prior to 1978. Assess the general condition of the house/apartment and the level of housekeeping/cleanliness.

INITIAL INTERVENTION/FOLLOW-UP

- Inform family of the child's lead exposure status, what lead poisoning is, the effect of lead, and the importance of monitoring blood lead levels at least every 1-2 months or as indicated by a physician
- Assist family in scheduling an appointment for a medical evaluation for lead poisoning and an appointment for preventive health care if indicated.
- Provide health education and referrals, as indicated. Stress importance of high iron, high calcium, high vitamin C, low fat diet, and the importance of washing child's hands and toys frequently.
- Explain common sources of lead and ways to reduce exposure such as cleaning with detergent, covering chipping paint with tape or plastic and restricting child from playing in a hazardous area.
- Tell the family that an environmentalist will visit within 2 weeks to assess the residence for additional and potential sources of lead.
- Initiate a referral to the local health department (LHD) environmentalist for an environmental assessment.
- If child's blood-lead level is 20µg/dL or greater, initiate a referral to a person certified to perform lead risk assessments.

FOLLOW UP ASSESSMENT

- Assess family's understanding of lead poisoning.
- Determine whether appointments are being kept.
- Observe child's physical status.
- Assess child's blood lead level status.
- Assess home environment. Determine whether temporary measures are continuing.
- Determine whether permanent measures have occurred or are planned.
- Determine if interim controls may help lower child's blood lead level.

FOLLOW-UP INTERVENTIONS

A follow-up visit is indicated for children who do not return to a clinic or physician for blood lead monitoring and children with blood lead levels that remain high, increase, or do not decline over time (*Appendix G & H*).

- Reinforce previous health education.

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- Stress importance of monitoring blood lead levels every 1-2 months for confirmed cases or as ordered by the physician
- Provide health education and referral, if indicated.
- Collect blood and/or schedule a clinic appointment, if indicated. (Coded “Screening” or “Confirmatory” sample. “Medical Follow Up” if child has been previously confirmed.)
- Reinforce previous recommendations. Provide education, as indicated.
- Stress importance that any workers performing abatement are certified in accordance with Kentucky regulation 902 KAR 48:040. Instruct that it is emphatic that pregnant women (*Appendix O*)* and children be kept away from work areas until clearance testing has been performed and approved by the Kentucky Environmental Lead Program. While extensive work is being done, it is preferable to move the family out of the home.



Medical Assessment

Medical case management for children with elevated blood lead levels is largely based on a secondary prevention model.² Measurement of blood lead levels is the main method of determining whether significant absorption of lead has occurred, how urgently intervention is needed, and how successful case management has been. It needs to be stressed that Case Managers and PCPs not equate the absence of clinical symptoms, physical abnormalities, or abnormal laboratory results with an absence of toxicity (*Appendix K*). Therefore, in accordance with the Kentucky *Public Health Practice Reference*, it is recommended that at every preventive health visit all children 6 months up to 6 years of age are evaluated using the questions on the “Verbal Risk Assessment for Lead Poisoning” (*Appendix L*) to determine their exposure to and risk of lead poisoning. A **blood** lead test should be routinely done from 9–12 months and at 24 months of age. If a child is aged 9–72 months and has never been tested, a **blood** lead test should be administered. Children who are Medicaid recipients or living in high risk zip code areas are **REQUIRED** to have a blood lead test at ages 12 and 24 months of age.

The following situations may create lead exposure for a child and should be included on the child’s Social History and Medical History. It is recommended^{1,2,6} that each question below should be reviewed by the child’s Primary Care Physician or Health Care Provider at each preventive health visit for all children ages 6 months up to 6 years. Documentation should be made in the child’s medical record at every visit noting that (a) the assessment was done, (b) any positive responses, and (c) any action taken.

1. Does the child live in or visit a building built before 1978 with peeling/chipping paint or with recent or ongoing remodeling?

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2. Does child have a brother/sister/playmate who has or did have lead poisoning?
3. Do you (or a family member) work on a farm; on a bridge, tunnel, or high construction area; with batteries, ammunition, or visit a firing range?
4. Do you use any folk remedies that may contain lead or use pottery or ceramic ware for cooking, eating, or drinking?

If the verbal risk assessment is negative at each visit, a blood lead test should be routinely done as prescribed above. A positive or “don’t know” answer to any question on the risk assessment will warrant a blood test for lead poisoning beyond the routine periodicity schedule.

Recommendations on the *Lead Screening Flow Chart (Appendix M)* describe actions to take with regard the blood lead level. Detailed information about blood lead levels and assessment, interventions, and follow-up activities recommended for each blood lead level class can be found in the *Lead Section (Appendix A)*.

Environmental Assessment

Leaded paint is the most common high-concentration source of lead for children and is typically seen in homes built prior to 1950.² Poorly maintained older homes with deteriorating paint or those undergoing renovation, whether they are the children’s primary residences or secondary sites where children spend 6 hours per week or more, pose the highest risk of lead exposure.

Lead can be found in high concentration in three media to which children may be directly or indirectly exposed – deteriorated paint, interior dust, and exterior soil or dust.² While less common, lead can also be found in a child’s water supply. The usual sites of deteriorating leaded paint are interior painted surfaces, particularly those subject to abrasion such as window components, and exterior surfaces like siding and porches.² Leaded dust can also be created by improperly conducted renovation and abatement.² Exterior soil is another significant source of lead and can become very contaminated from deteriorating overlying leaded paint, driplines, or lingering fall-out from previously used leaded gasoline, especially along heavily traveled roads.² Water from a municipal water supply is not usually a source for lead exposure due to the corrosion controls applied and the monitoring of heavy metals (i.e. lead) that is required during routine treatment. However, water from non-monitored sites such as wells, cisterns, ponds, barrels, etc. is a possible source for lead exposure due to its ability to dissolve lead from older pipes and solder found in pre-1978 homes or from lead found in its natural environment.

- In accordance with the Kentucky *Public Health Practice Reference*¹ an environmental assessment is required and should be performed by a certified risk assessor with a confirmed blood lead level of 15µg/dL or greater.. The child’s residence and any other dwelling the child spends 6 hours or more per week is assessed for lead hazards within 14 working days from the risk assessment request. Environmental assessments include: Education about the following:

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- The risk assessment process
 - Common routes of lead exposure
 - The nature of lead
 - Appropriate interim controls to be used until the risk assessment test results are received
 - Their rights and responsibilities under Title X EPA/HUD disclosure rule and
 - Answers to any questions that may arise.
- A close examination of the history of the child's exposure and the habits, hobbies and occupation of the child and family that may have lead to exposure.
 - Visual Assessment of the interior and exterior of all buildings the child may come in contact with that exists on the property of the dwelling.
 - Measurements of environmental lead levels in dust, deteriorated paint, exposed soil and water (from non-municipal water sources).

A report is generated by the risk assessor and sent to:

- The local health department
- The parent
- The property owner
- The occupant
- The Environmental Lead Program (ELP)
- The KHHLPPP
- Department of Housing and Urban Development (HUD), the local Kentucky Housing Authority, United States Department of Agriculture (USDA), etc. depending on if the family is receiving any assistance from these entities.

The risk assessor, KHHLPPP, ELP and owner of the home will collaborate to have all lead hazards addressed in a timely manner in accordance with Kentucky's regulations. A clearance test is required after the work is completed in order to assure the home is lead safe.

The risk assessor will contact the local health department case manager to assess the need of the EBL child every 90 days from the date of the risk assessment. If the child's blood lead level is not improving after the lead hazards have been addressed, then other lesser known sources of lead than paint are investigated further (i.e. previous addresses, the home's water supply (if not previously tested), pets, objects the child places in his/her mouth, etc.) until closure as designated by the PPHR.

Nutritional Assessment

Although the effectiveness of nutritional interventions clinically has not been established² much is known about nutrition and its role in lead poisoning prevention. Children with elevated blood lead levels are often at risk for poor nutrition, and their caregivers should receive nutritional counseling to help these children obtain a well-balanced and age-appropriate diet.

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The gastrointestinal tract is the primary site of lead absorption in children.⁵ Children absorb up to 50% and adults absorb up to 10% of the lead they ingest. These differences are due mostly to gastrointestinal maturity. Approximately 68% of the lead ingested is retained in the body of a child and a positive balance occurs when the daily ingestion of lead exceeds 5 µg/kg body weight.⁵

Lead is better absorbed with liquids than with solids, especially when the stomach is empty. On a full stomach (adults) 6% of the lead ingested is absorbed. On an empty stomach (adults) approximately 60% – 80% is absorbed.

Deficiencies in trace minerals – calcium (Ca), iron (Fe), and zinc (Zn) – enhance lead uptake. For example, iron deficiency increases lead absorption 6-fold and there is an inverse relationship between dietary calcium intake and blood lead concentrations. In low-mineral, high-fat diets, lead absorption is increased 50-fold. Lead may also compete for absorption with other divalent cations such as cadmium, copper, magnesium, and zinc.

In some cases, dietary fiber may facilitate lead elimination. About 99% of the amount of lead taken into the body of an adult will leave in the waste within a few weeks, but only about 32% will be eliminated from a child.

Inadequate total calories and infrequent meals (both of which are more likely to be found in children from lower socioeconomic groups) increase the absorption of ingested lead.

Because children with elevated blood lead levels are at risk for poor diet, children with elevated blood lead levels should be referred to supplemental food programs that provide nutritional counseling and access to healthy foods. It should be determined whether children with elevated blood lead levels are eligible for WIC and ensure their access to this program if they are eligible.

Education for the Caregiver

Educating caregivers is an important part of case management. Caregivers need to understand elevated blood lead levels and the risks that an EBLL poses to their child, what they can do to eliminate their child's exposure to lead, and the importance of follow-up testing and care.

Educational interventions are directed at helping caregivers reduce the exposure of children to residential and other sources of lead. While most children are exposed through the deterioration of leaded paint, they may also be exposed to lead from other sources. Some of these exposures are a consequence of cultural practices or caregiver occupations or hobbies. (See Verbal Risk Assessment for Lead Poisoning -*Appendix L*)

Education should be reinforced during follow up visits as needed. Health departments can furnish educational materials and pamphlets to the caregiver and health-care provider. These materials can be obtained in either English or Spanish by contacting the Kentucky **CHILDHOOD LEAD POISONING PREVENTION PROGRAM**, or visiting the web site at WWW.PUTTHELIDONLEAD.ORG. (The Childhood Lead Poisoning Prevention Program will

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also assist in having materials translated into other languages as necessary.) Several websites have materials that can be easily downloaded and printed, as well.

Childhood Lead Poisoning Prevention Program Resources
<p>“Lead Poisoning: Are Your Children at Risk?” (pamphlet) “Lead Poisoning: Are Your Children at Risk?” (1 page information sheet) “Prevent Lead Poisoning Eat Healthy” (pamphlet) “Put the Lid on Lead” (Information & Coloring Sheet) “Lead Poisoning And Your Children” (EPA Pamphlet) “Protect Your Family From Lead In Your Home” ((EPA pamphlet) “Lead Paint Safety” (A field guide for painting, home maintenance, and renovation work) (CDC, HUD,EPA) “Lead : What You Should Know to Protect Your Family” (pamphlet) “Lead Hazards: Guidelines for Repairs” (pamphlet) “Lead Based Paint Pre-renovation Rule” (EPA pamphlet) “Real Estate Notification Rule: Questions & Answers” (EPA, HUD pamphlet) “Remodeling Information Sheet” (HUD) “Routine Cleaning as an Interim Control for Lead Dust” (pamphlet)</p>
Websites
<p>http://www.putthelidonlead.org (HHLP web site) http://www.chfs.ky.govdph/lead (Cabinet for Health & Family Services) http://www.aecdp.org (Alliance to End Childhood Lead Poisoning) http://www.hud.gov/offices/lead (Office of Healthy Homes & Lead Hazard Control; U.S. Dept. of HUD) http://www.leadlisting.org (Leadlisting) http://www.leadshousing.org (National Center for Lead Safe Housing) http://www.epa.gov/lead/nlic.htm (National Lead Information Center)</p>
Other resources
<p>Sesame Street Video Collecting and Handling Blood Lead Samples-2004 Video & Compact Disk (CDC) Volunteers Opening Doors <i>The Five Keys to Lead Safety</i> (A lead-poisoning awareness video for volunteer painting and housing-rehabilitation programs) Video & Compact Disk Research Articles “Lead House” PowerPoint Presentations Lead Story Board</p>

In conclusion, as recommended by the CDC,¹ families of children with elevated blood lead levels of 10µg/dL or greater should be provided prompt child and caregiver appropriate individualized education about (*Appendix N*):

- Their child’s blood lead level and what it means.
- Potential adverse health effects of the elevated blood lead level.
- Sources of lead exposure and suggestions on how to reduce exposure.
- Importance of wet cleaning to remove lead dust on floors, window sills, and other surfaces; the ineffectiveness of dry methods of cleaning, such as sweeping.
- Importance of good nutrition in reducing the absorption and effects of lead, with poor nutritional patterns, discuss adequate intake of calcium and iron and regular meals.
- Need for follow up blood lead testing to monitor the child’s blood lead level, as appropriate (See Lead Classification Chart).
- Results of environmental inspection, if applicable.
- Hazards of improper removal of lead-based paint. Particular hazards are open-flame burning, power sanding, water blasting, methylene chloride-based stripping, and dry sanding and scraping.

Case closure

The ultimate objective of the case management process is to assure that both the medical treatment of the lead poisoned child is accomplished and the environmental exposure routes are addressed. There are two possible case closure options – medical closure and administrative closure.

In general, and in accordance with the Kentucky *Lead Section* guidance, **MEDICAL CASE CLOSURE** occurs when (1) a child's blood lead level is $< 10\mu\text{g}/\text{dL}$ for 6 months, (2) lead hazards have been removed from the child's residence, and (3) there are no new hazards. This option also includes **ENVIRONMENTAL CASE CLOSURE** and occurs when all lead hazard reduction orders are completed and **CLEARANCE TESTING** demonstrates no new hazards. Prior to closure, however, the nurse/case manager should discuss appropriate long-term follow up with the child's caregiver and PCP. CDC case closure recommendation criteria also suggest provisions for **ADMINISTRATIVE CASE CLOSURE** if at least three documented attempts to locate or gain access to the child and caregiver have failed.²

The Case Manager has the responsibility for determining when to close the case of the child – medical or administrative – while the certified risk assessor/evaluator is responsible for determining when to close the case of the property – environmental closure. The Case Manager should collaborate with the environmentalist to ensure that the child has a lead-safe environment in which to live. In order to attain a **COMPLETE CASE CLOSURE**, both medical and environmental closures must be complete.

There may be unique circumstances associated with an individual lead case that would necessitate additional attention beyond lead closure. However, this should be determined on a case-by-case basis at the professional discretion of the Case Manager. Additional referrals to social service agencies or complimentary programs may also be considered, and may be strongly recommended, depending on the specific circumstances of the case.

Referral Services

Linking children and families with needed services

An important aspect of the Case Manager's role is making referrals. The Case Manager is responsible for placing the family of a child with an elevated blood lead level in contact with services and resources that are available in the local community or through state-run programs. These resources may be needed by families that are working to resolve lead exposure issues.

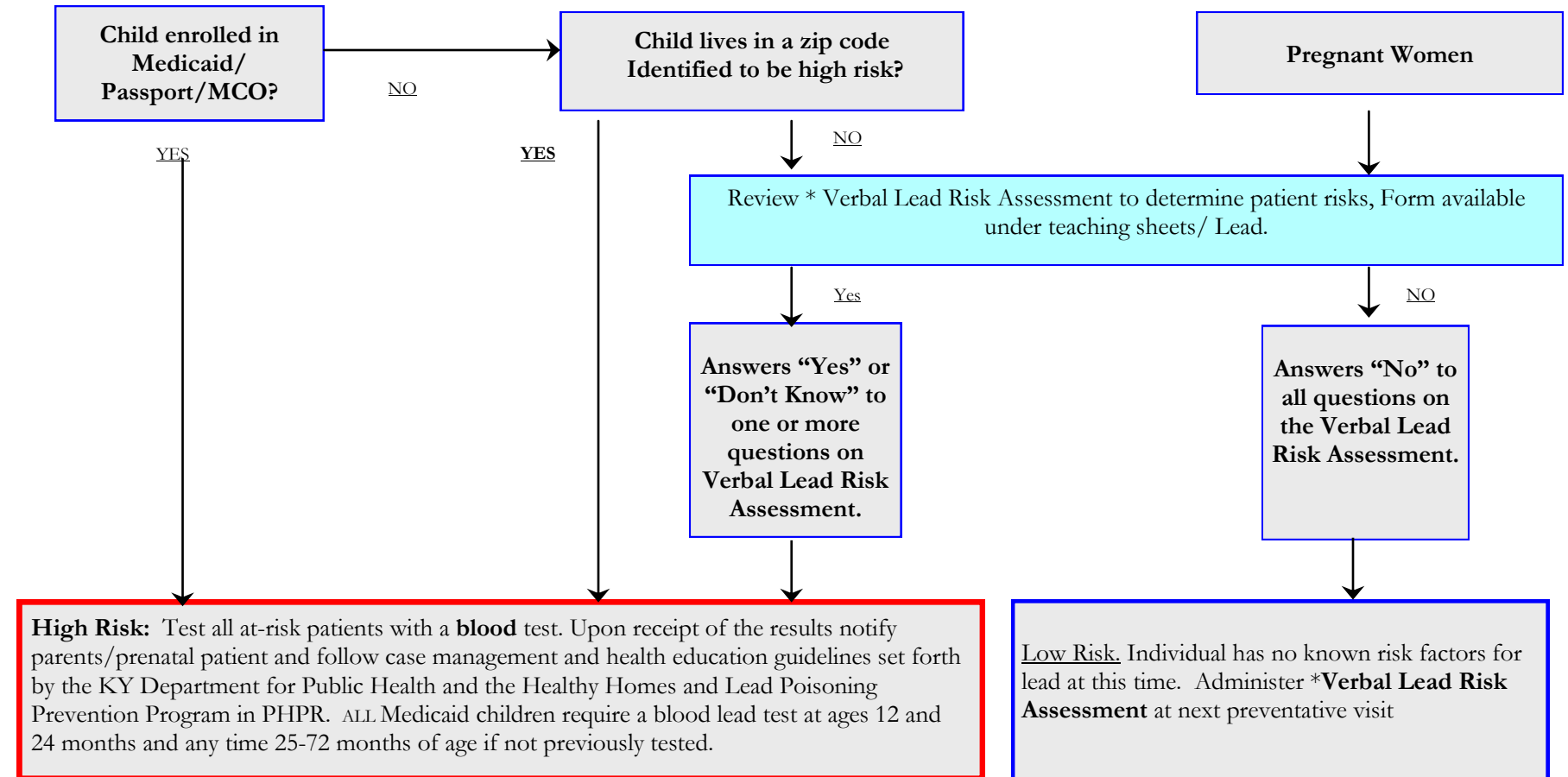
Through the *Lead Management Home Visit* protocol described in Chapter 3, the Case Manager has a unique opportunity to enter a home, complete an assessment (*Appendix C & D*), and provide assistance to the family. The Case Manager's role should not be limited to assisting with lead exposure prevention only. It may also include helping families gain access to resources for addressing other issues, coordinating efforts and ensuring that they have enough information about each child's situation. Potential referral sources should include, but not be limited to, environmental assessment, WIC, medical providers, developmental assessment, social services and other community sources.

Encouraging and supporting families without making them feel guilty for their child's elevated blood lead level or making unrealistic demands on them may offer the greatest benefit to the child. When talking with the families stress and build on what the families are already doing right to encourage an increase in preventive strategies.

References

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- ³ Meyer PA, Pivetz T, Dignam TA, Homa DM, Schoonover J, Brody D. Surveillance for Elevated Blood Lead Levels Among Children – United States, 1997-2001. In: Surveillance Summaries, September 12, 2003. MMWR 2003;52(No. SS-10):2
- ⁴ Lanphear BP, Dietrich PA, Cox C. Cognitive Deficits Associated with Blood Lead Concentrations < 10 µg/dL in US Children and Adolescents. Public Health Reports 2000; 115:521-529.
- ⁵ Anderson AC, Puschel SM, Linakis JG. Pathophysiology of Lead Poisoning. In: Lead Poisoning in Childhood (Puschel SM, Linakis JG, Anderson AC, editors. Baltimore: Paul H. Brookes Publishing Co., 1996:75-96
- ⁶ Centers for Disease Control and Prevention. Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials. Atlanta: CDC, 1997:62, 86-87

Lead Poisoning Prevention Screening Guide



*American Academy of Pediatrics (AAP) recommends verbal lead risk assessment to be performed at ages 6, 9, 12, 18, and 24 months, and ages 3, 4, 5, and at 6 years with appropriate action to follow if blood lead level is positive. AAP recommends and Medicaid requires blood lead testing at ages 12 and 24 months.

SEE PRENATAL LEAD SCREENING GUIDELINES IN PRENATAL SECTION FOR PRENATAL PATIENTS

NOTE: According to the Centers for Medicare & Medicaid Services' Early and Periodic Screening, Diagnosis and Treatment (EPSDT) guidelines, all EPSDT examinations must include a blood lead laboratory test for children at 12 and 24 months of age and anytime under the age of 72 months if not previously tested. See PHPR Lead Guidelines on case management, health education and medical referrals.

GUIDELINES FOR BLOOD LEAD LEVELS (BLL) AND FOLLOW-UP

Blood Lead	BLOOD LEAD LEVEL	ASSESSMENT	INTERVENTIONS	FOLLOW-UP
	Less than 10 µg/dL 0-9.9µg/dL	Not considered lead poisoning <i>(No amount of lead in the body is normal. Even low blood lead levels can cause adverse neurological effects such as loss of IQ points and learning disabilities. It is very important that education on ways to prevent lead poisoning begin at this level)</i>	<ul style="list-style-type: none"> Continue to review risk assessment questions at each preventive health visit up to 6 years of age with routine blood lead testing at 12 and 24 months on all Medicaid recipients/ and at-risk children who live in a targeted screening area or have positive risk factors. Complete routine blood lead testing for at-risk patients (Medicaid, Targeted Zip Code areas, and “+” or “don’t know” verbal lead risk assessment responses Parent education pamphlets Refer for WIC services Contact State HHLPPP NCI if you have questions 	<ul style="list-style-type: none"> Annual blood lead test once a positive risk factor is identified. Retest at next periodicity visit if risk factor changes Medicaid recipients or children who reside in a targeted screening area: <ol style="list-style-type: none"> Routine blood lead level obtained at 12 and 24 months of age. Blood lead level obtained on all children 25 months–6 years of age who have never been screened.
	10–14.9 µg/dL	Level of concern 1 st specimen at this level	<ul style="list-style-type: none"> Parent education pamphlets Mail or fax monthly report to HHLPPP NCI, contact if any questions; send report form if 2nd level in the 12 weeks is >10µg/dL Refer for WIC services <p><u>Home Visits:</u></p> <ul style="list-style-type: none"> If 1st specimen at this level nurse or allied health professional and/or local environmentalist may make home visit and visual investigation *If 2nd BLL remains at this level, nurse and/or local environmentalist *must make a home visit for visual investigation within 30 days of 2nd EBL result. 	<ul style="list-style-type: none"> Repeat blood lead level in 12 weeks of the initial, if BLL is still in this range repeat every 12 weeks until blood lead level is < 10 µg/dl. Establish a tracking system that assures retesting. Case management.

* SEE PRENATAL LEAD SCREENING GUIDELINES IN PRENATAL SECTION FOR PRENATAL PATIENTS

BLOOD LEAD LEVEL	ASSESSMENT	INTERVENTIONS	FOLLOW-UP
<p>15–29.9µg/dL</p>	<p>Lead Poisoning ≥15µg/dL</p> <p>Venous Specimens are uncontaminated, preferred and considered confirmation</p> <p>First capillary specimen at this level will need to be confirmed 2nd Capillary is acceptable; however, special care is needed when using a 2nd capillary specimen as a confirmation for lead poisoning</p>	<ul style="list-style-type: none"> • Parent education pamphlets • Contact state HHLPPP NCI if guidance needed <p>Once Lead Poisoning is Confirmed:</p> <ul style="list-style-type: none"> • Refer for Medical Nutrition Therapy and WIC services. • Refer to a primary care provider (PCP) for medical evaluation. Provide PCP with letter/information with lead specialist consult. • Initial home visit by nurse or allied health professional within 1 week. • Visual investigation to be made within 1 week of LHD receiving confirmed EBLL results by an RN and/ or Environmentalist. • Refer to a *Certified Risk Assessor to perform a lead risk assessment within 2 weeks of LHD receiving confirmed EBLL results. <i>*Contact KY HHLPPP if your HD does not have a Certified Risk Assessor</i> 	<ol style="list-style-type: none"> 5. Submit confirmation (see assessment criteria) specimen within one week 6. Repeat blood lead levels at 1–2 month intervals until: <ol style="list-style-type: none"> a. Blood lead level is less than 10µg/dl for 6 months b. or as s ordered by the physician 7. Establish a tracking system that assures retesting and case management 8. For medical case closure see case closure section 9. Environmental: Lead hazards have been addressed.
<p>30-44.9µg/dL</p> <p>A VENOUS specimen is needed to confirm a diagnosis of lead poisoning at this level.</p>	<p>Lead Poisoning ≥15µg/dL</p>	<ul style="list-style-type: none"> • Environmental: Lead Risk Assessment to be completed within 30 days of Risk Assessor receiving referral from LHD, 'Environmental' guidance can be found in AR • Mail or fax report to HHLPPP NCI 	<p>Same as above</p>

SEE PRENATAL LEAD SCREENING GUIDELINES IN PRENATAL SECTION FOR PRENATAL PATIENTS

Blood Lead	BLOOD LEAD LEVEL	ASSESSMENT	INTERVENTIONS	FOLLOW-UP
	45–69.9 µg/dL A VENOUS specimen is needed to confirm a diagnosis of lead poisoning at this level.	Lead Poisoning BLL \geq 15 µg/dL	Same as listed above except refer to PCP for medical evaluation. Provide PCP with letter/information with lead specialist consult within 48 hours.	<ul style="list-style-type: none"> • Submit confirmation (see assessment criteria) specimen within 48 hours • During and post chelation therapy, retest monthly until: • Blood lead level is less than 10µg/dl for 6 months (capillary specimens are acceptable) • or as s ordered by the physician • Establish a tracking system that assures retesting and case management • For medical case closure see case closure section • Environmental: Lead hazards have been addressed
	70µg/dL and above A VENOUS specimen is needed to confirm a diagnosis of lead poisoning at this level.	Lead Poisoning BLL \geq 15 µg/dL MEDICAL EMERGENCY	Same as listed above except refer to PCP for medical evaluation. Provide PCP with letter/information with lead specialist consult within 24 hours.	<ul style="list-style-type: none"> • Submit confirmation (see assessment criteria) specimen within 24 hours • During and post chelation therapy, retest monthly until: • Blood lead level is less than 10µg/dl for 6 months (capillary specimens are acceptable) • or as s ordered by the physician • Establish a tracking system that assures retesting and case management • For medical case closure see case closure section • Environmental: Lead hazards have been addressed

▪Case Management:

Environmental lead exposure continues to cause harm, particularly to young children and pregnant women. This section of the PHPR offers guidance on the provision of lead screening and follow-up services for children 6–72 months of age. Lead screening and follow-up guidelines for pregnant women are included in the Prenatal Section of the PHPR.

According to the Centers for Disease Control and Prevention (CDC), case management of children and pregnant women with elevated blood lead levels involves the coordination, provision and oversight of services required to reduce lead levels to below a level of concern. A hallmark of effective case management is ongoing communication with the caregivers and other service providers, and a cooperative approach to solving any problems that may arise during efforts to decrease a patient's elevated blood lead level, and eliminate lead hazards in the patient's environment.

Case management is much more than a simple referral to other service providers. There are 8 components, which should be under the purview of a registered nurse:

- Client identification and outreach
- Individual assessment and diagnosis
- Service planning and resource identification
- The linking of clients to needed services
- Service implementation and coordination
- The monitoring of service delivery
- Advocacy
- Evaluation*

Case management should occur for every child with a 2nd blood lead level of 10µg/dL or greater and for every pregnant woman with a venous level of 5µg/dL or greater. Children and pregnant women with elevated blood lead levels become “**health department patients**” when their cases are brought to the attention of staff, even if they are or have been receiving direct clinical services elsewhere. They will remain a health department patient until patient case closure.

The report forms are used to coordinate communication between the LHD lead case managers and the state HHLPPP NCI in an effort to assure that all children with an EBLL receive appropriate and timely care. The KHHLPPP NCI monitors incoming lab data and compares this with identified EBLL children reports sent from the LHD. A HHLPPP Initial Report Form includes demographics including ***zip code**, contact information, social security and a Medicaid number if relevant, actions/interventions marked for appropriate BLL's, dated, and initialed where appropriate, as soon as the health department case manager becomes aware of a child with a BLL of 10µg/dL or greater. **A zip code must be included to enter the data into the system.*

The KHHLPPP initial report form must be filled out for all children with a 2nd blood lead level of 10 - 14µg/dL or confirmed BLL of 15 µg/dL or greater and for every pregnant woman with a venous BLL of 5µg/dL or greater. The original report is to be placed in the patient's chart and a copy of this form may be faxed or mailed to the KHHLPPP NCI.

After the completed Initial Report Form has been sent to KHHLPPP, updates can be entered on the *HHLPPP Monthly Report Form*. This form should be kept in in patient's chart and updated as appropriate with follow-up

BLL's and necessary interventions noted. Copies of the monthly report form will need to be faxed to the KHHLP NCI when new entries are made.

If the patient's BLL increases, thus changing needed interventions please send updated information with appropriate interventions noted to the KHHLP NCI.

Verbal Lead Risk Assessment

Review each of these questions at every preventive service for all children ages 6–72 months. American Academy of Pediatrics (AAP) recommends verbal lead risk assessment to be performed at ages 6, 9, 12, 18, and 24 months, and ages 3, 4, 5, and at 6 years with appropriate action to follow if blood lead level is positive. AAP recommends and Medicaid requires blood lead testing at ages 12 and 24 months

Pregnant Women

Review each of these questions at the positive pregnancy test visit or initial prenatal visit to determine if patient is at-risk.

A copy of the Verbal Lead Risk Assessment is in the Forms and Teaching Sheets/Teaching Sheets/Lead/ACH 25 section of the PHPR. The questionnaire reviews potential patient risks such as:

1. Does the patient live in or visit a building built before 1978 with peeling/chipping paint or undergone recent or ongoing remodeling (dust)?
2. Does the patient or any other members of the household (child's playmate/ brother/sister/ patient's spouse) have a history of elevated blood lead levels or who has had lead poisoning?
3. Does the patient or someone who visits or in the household work in an occupation known or suspected to involve lead? Common industries using lead include but are not limited to:

Auto mechanics/bodywork	Plumbing	
Farm/Migrant Farm Work	Blowing Glass	Jewelry Making/Repair
Furniture Refinishing	Gardening	Metal Sculpting
Renovation Work	Painting	Stained Glass
Painting Roads	Printing	Car/Boat repair
Metal Work/Welding	Casting Aluminum	Firing Ranges
Plastics manufacturing	Ceramic Making	Firearms/Firing Range
Radiator Repair	Battery Recycling/Smelting/Recycling	
Making Bullets/Sinkers/lead toys	High Construction Area	Electronic soldering
Home Repairs/Remodeling	Bridge Repair/Painting	Smelting Metals/ Scrap yards

4. Does the patient use any folk remedies that may contain lead or use pottery or ceramic ware for cooking, eating, or drinking or participate in hobbies that may involve lead such as ceramic pottery, jewelry making, gardening or stained glass?

IMPORTED COSMETICS: ▪ **Middle East, India, Pakistan, Africa** ▪ Kohl, Surma, Al Koh: a powder used both as a cosmetic eye make-up and applied to skin infections and the navel of a newborn child. And can be ingested when on hands ▪ Kajal: eye cosmetic when used can be ingested if on hands.

▪ Sindoor: a powder applied to face or scalp during ceremonies, mistakenly used as food

FOODS: ▪ **Middle East:** ▪ Lozeena: a bright orange powder used by Iraqis to color rice and meat ▪ **Mexico** ▪

▪ Chapulines (dried grasshoppers): can be chocolate coated; grasshoppers eat chilies that are contaminated with lead from soil and area silver mine fallout

FOLK REMEDIES: ▪ **Hispanic** ▪ Azarcon aka: Ruedo, Corol, Maria Luiso, Alarcon, Ligo: used for intestinal illness. ▪ **Mexico** ▪ Greta: a yellow powder used for intestinal illness. ▪ **Dominican Republic** ▪ Litargirio: yellow peach powder used as a deodorant, foot fungicide, treatment for burns and wound healing. ▪ **Vietnam/ Hmong Community** ▪ Pay-loo-ah- a red powder given for rash or fever. ▪ **Asian/ Tibet/ India/Thailand** ▪ Ayurvedic

medicine, ▪ **Tibetan Herbal Vitamin** ▪ **China** ▪ Jin Bu Huan: used to relieve pain, ▪ Po Ying Tan: used to treat minor ailments in children, Ba-Baw-San. ▪ **India** ▪ Ghasard: a brown powder given as an aid to digestion. ▪ **Thailand** ▪ Daw Tway is a digestive aid used in Thailand and Myanmar (Burma). ▪ **Iran** ▪ Bint Al Zahab: Rock ground into a powder and mixed with honey and butter given to newborn babies for colic and early passage of meconium after birth. ▪ **Saudi Arabia** ▪ Traditional Saudi Medicine: Orange powder prescribed by a traditional medicine practitioner for teething; also has an antidiarrheal effect, ▪ Santrinj: An amorphous red powder containing 98% lead oxide used principally as a primer for paint for metallic surfaces, but also as a home remedy for "gum boils" and "teething." ▪ Bint Dahab: A yellow lead oxide used by local jewelers and as a home remedy, ▪ **Kuwait** ▪ Bokhoor: A traditional practice of burning wood and lead sulphide to produce pleasant fumes to calm infants. **Other:** ▪ Bala Goli: a round, flat, black bean dissolved in 'gripe water' and used for stomach ache. ▪ Kandu: a red powder used to treat stomach ache.

5. Does the patient live near a busy road/ highway?

Soil around your home could be contaminated by the leaded gasoline fallout, on your soil or in water (cisterns/wells) for many years following contamination and can get on your child's hands. Lead can also be absorbed in fast growing plants such as Kale, spinach, and other garden vegetables from the soil and then consumed by animals and humans and can lead to increase in blood lead levels.

Document in the medical record at every visit that the assessment was completed, any positive response(s) and action(s) taken:

- If the verbal risk assessment is negative at each visit, a blood lead level test should be routinely done for all Medicaid children and children who reside in a **targeted zip code area at 12 and 24 months of age.
- A "Yes" or "don't know" answer to any question on the risk assessment will warrant a blood test for lead poisoning at that time, regardless of the child's payer source or zip code area.
- Any child with a positive risk factor should be tested at least annually, until 72 months of age, as long as any risk factor exists.

A "Yes" or "don't know" answer to any question on the risk assessment will warrant a blood test for lead poisoning or a referral to the PCP. See also the Prenatal section of the PHPR for Lead Screening Guidelines and Follow Up.

Document in the medical record at the initial prenatal visit and anytime that the assessment was done, any positive response(s), and action taken according to the class chart guidelines located in the Prenatal section of the PHPR.

For prenatal lead exposure, case closure ends for the pregnant woman at delivery of the infant. If the BLL is >25ug/dL, follow-up will be with the patients PCP. The newborn will need to be tested at delivery. A cord blood sample is to be used for testing at the time of delivery. Protocols for case management will be initiated for newborns with BLL's ≥ 10 ug/dL.

■ BLOOD LEAD TESTING

All children and pregnant women regardless of payer source must have a blood test if they have a “Yes” or “don’t know” answer to any question on the risk assessment. For Medicaid enrolled pregnant women, Medicaid will pay for a blood lead screening, all others will need to pay per sliding fee scale or private insurance.

All children who receive Medicaid benefits or reside in a **targeted zip code area must have a blood lead test at 12 and 24 months of age.

All children between 25 and 72 months of age who receive Medicaid benefits or reside in a targeted zip code area must be provided a blood lead test when they present to the health department if they have not previously received a documented blood lead test.

*See Blood Specimen Collection Guidelines in the Lead Section and also the Lab Section

COMPLETION OF LABORATORY SUBMISSION FORMS

A. SCREENING

This should be checked for the:

- initial capillary sample; first venous sample
- venous samples should always be taken on pregnant women
- re-screenings of children with levels equal to or greater than 10ug/dL
- and any screening test being repeated due to clot, insufficient quantity, or any other reason the sample could not be analyzed.

B. CONFIRMATORY

This should be checked for:

- the *second capillary* sample when the first capillary sample was equal to or greater than 15 micrograms per deciliter (lead poisoning).
- venous samples submitted as confirmatory samples after a first capillary sample was equal to or greater than 15 micrograms per deciliter and
- confirmatory tests being repeated due to clot, insufficient quantity, or any other reason the sample could not be analyzed.

C. MEDICAL FOLLOW-UP

This should be checked for:

- follow-up tests of ALL children who have been previously confirmed to be lead poisoned and
- medical follow-up tests being repeated due to clot, insufficient quantity, or any other reason the sample could not be analyzed.

NOTE: If a venipuncture is done as an initial screening and the results are greater than or equal to 15 micrograms per deciliter, this is to be considered a confirmed case of lead poisoning. Follow the recommended actions for levels greater than or equal to 15ug/dL as indicated in the “Protocol for Blood Lead Levels and Follow-Up.”

NOTE: See Administrative Reference for payment procedures.

Home Visits And Environmental Management For Patients With Elevated Blood Lead Levels

According to KRS 211.905, an inspection of the property where an EBLL child routinely spends more than six (6) hours per week should be completed to determine the existence of lead-based hazards.

Priority should be given to the child's primary place of residence. The environmental investigations may include the visual as well as the comprehensive lead risk assessment to determine the existence of lead based hazards.

Environmental Management through home visits is one component of an on-going process related to the elimination of lead poisoning as a public health problem. Home visits and visual investigations help to:

- Identify areas in the home that could potentially be a source for lead exposure;
- Provide suggestions and educational materials to the family in an effort to make the home lead-safe;
- Reduce the patient's current BLL to less than 10µg/dL by reducing or eliminating the amount of lead exposure;
- Assure that patient's with BLL's 10µg/dL and greater receive timely and appropriate care.

Collaboration of the environmentalist and the lead case manager assures appropriate and timely environmental home visits and investigations for patients who are identified with EBLL's. Interventions during investigations include:

- Informing the patient/parent/guardian/care giver of child's blood lead level; review level of understanding; monitoring of blood lead levels,
- Reviewing what lead poisoning is and common sources of lead, provide educational materials;
- Reviewing health education and preventive lead poisoning strategies, provide suggestions in an effort to make home lead safe and to reduce the amount of lead exposure;
- Reviewing lead poisoning prevention diet,
- Reviewing patient's physical status, including behavior problems/changes, nutritional status and specific habits such as placing fingers in mouth or eating dirt or paint chips;
- Establishing who is providing patients primary and acute health care;
- Visualize the patient's home environment and child play areas to identify potential sources of lead; is the home pre-1978 and have chipping, peeling paint or dust throughout home and discuss emergency measures to reduce the patient's lead hazard exposure;
- Assure the well-being of the child by referring to appropriate agencies; services may include social services for emergency or temporary housing agencies.

Home visits by a nurse or allied health professional as defined in the Home Visiting Section of the PHPR, are to be conducted for all children referred into or already receiving services in a health department clinic with a second blood lead level remaining at 10–14µg/dL or a confirmed blood lead level of 15µg/dL micrograms per deciliter or above and for pregnant women with a BLL of 10ug/dL or greater.

Upon receipt of *elevated blood lead level* (EBLL) results, the lead case manager is responsible for referrals to the environmentalist or risk assessor for appropriate environmental investigations. For children identified as having BLL's of:

- 2nd BLL of 10µg/dL or greater, a home visit and **visual investigation** are to be completed at the children and pregnant women's primary residence to identify potential sources of lead.
 - **Confirmed** BLL of 15µg/dL or greater (lead poisoning), in addition to the home visit/visual investigation, a **lead risk assessment** must be completed by a certified risk assessor.
-

- The environmentalist is responsible for assuring priority is given to those cases with the highest blood lead levels.
If your health department or district does not employ a certified risk assessor, please contact the KHHLP• 502-564-2154•275 East Main Street •Frankfort • KY •40621
- If a lead poisoned child is referred to the health department and no environmental risk assessment has been completed on their current home, referrals for a lead risk assessment may need to be completed for those patients living in at-risk conditions.

Investigation of the Primary Address:

The initial home visit should be initiated by the LHD lead case manager or home visiting nurse following time frames listed below (See Table 1). The visual investigation is generally completed by the environmentalist. The visual investigation can also be completed at the time of a home visit by a trained home visiting RN. Investigations should be conducted within the appropriate timeframes according to CDC's recommendations. (See Table 1) However, KHHLP recommends timeframe of two (2) weeks for BLL's 10-14ug/dL to visualize potential sources

of lead and to review preventive education with the parent/guardian/.care giver and to prevent further elevation of the BLL.

Table 1: Home Visit and Visual Investigation

Blood Lead Level	Time Frame for Assessment
2 nd BLL 10-14ug/dL	4 weeks of 2nd BLL in this range
15-19.9 µg/dL	2 weeks; refer for comprehensive lead risk assessment
20-44.9 µg/dL	1 weeks; refer for comprehensive lead risk assessment
45-69.9 µg/dL	48 hours; refer for comprehensive lead risk assessment
≥70 µg/dL	24 hours; refer for comprehensive lead risk assessment

At the time of the assessment, preventive education should be reviewed with the parents/guardians/care giver. **Preventive education** includes discussing the child's potential source of lead-based hazards and how to prevent further exposure to those sources, increase child's hand washing with soap and water, house cleaning techniques such as damp dusting, wet mopping, and daily vacuuming of the home. Temporary measures to reduce further exposure are not required within a specific timeframe, however it is recommended to keep the child away from the potential sources. If the child's BLL should increase to lead poisoning (BLL >15ug/dL), it is required per KRS 211.905 to correct any identified lead hazards within sixty (60) days. Temporary measures may include but are not limited to:

- Blocking child from potential hazardous area with a barrier, (i.e. door, child gate);
- Using furniture to block child's access to the hazard (i.e. furniture in front of a chipping window sill);
- Use of duct or masking tape and plastic or cardboard to cover an area of chipping/peeling surface until permanent work can be conducted;
- Daily damp dust, wet mop and vacuum with a hepa vac especially in the child's play area;
- Wipe child's toys clean, keep toys in clean dry tote, and placing tote in clean play area and limiting the child's play to this area; (especially if child is crawling and/or in hand-to-mouth exploration stage);
- Keep child's hands washed with soap and water, (germ gel does not remove lead), wash hands before snacks and meals and before any nap or bedtime (especially if child is crawling and/or in hand-to-mouth exploration stage);
- Exploring the possibility to relocate child(ren) and pregnant women from the home while renovation/remediation work is in progress.

A thorough visual investigation of the child's home identifies possible sources of lead. The investigation should visualize both the interior and exterior environment of the child with attention given to child accessible painted surfaces, dust and soil. Other potential sources of lead should be considered during the assessment i.e., water, family occupation, hobbies, etc.

If the BLL remains elevated or at a level of lead poisoning and is not decreasing in 8-12 weeks, an environmental investigation may need to be conducted at another property where the child routinely spends more than six (6) hours a week.

The home visit/visual investigation form should include any pertinent information from the child's parent/guardian/care giver that is not already supplied on the referral form. This should include the following:

- How long the child has lived at this address
- Supplemental address information
- Number and names of children that live or visit here
- Owners name, address and phone number
- Child's play areas, sleep areas, habits
- Parents occupations, hobbies, other possible sources.

Lead Risk Assessments

For children identified with *confirmed* lead poisoning, a BLL $\geq 15\mu\text{g}/\text{dL}$, a lead risk assessment is required according to KRS 211.905 (1). Comprehensive Lead Risk Assessments referrals are made by the LHD **case manager** and should be conducted by a certified risk assessor within the appropriate time frames per CDC's recommendations. (See Table 2)

Table 2: Comprehensive Lead Risk Assessment

Blood Lead Level	Time Frame for Assessment	Type of Assessment
$\geq 70\mu\text{g}/\text{dL}$	Within 24 hours	Comprehensive Lead Risk Assessment
45-69.9 $\mu\text{g}/\text{dL}$	Within 48 hours	Comprehensive Lead Risk Assessment
20-44.9 $\mu\text{g}/\text{dL}$	Within 1 weeks	Comprehensive Lead Risk Assessment
15-19.9 $\mu\text{g}/\text{dL}$	Within 2 weeks	Comprehensive Lead Risk Assessment
Persistent BLL at 10-14 $\mu\text{g}/\text{dL}$	Within 4 weeks	Comprehensive Lead Risk Assessment

The lead risk assessment report can take up to 30-90 days to process and receive.

Follow-Up Home Visits

Follow-up home visits also assure measures for lead poisoning prevention are continuing. Follow-up home visits are also indicated when:

- a. Child fails to return for blood lead monitoring
- b. blood lead levels remain elevated
- c. blood lead levels are increasing
- d. at any other time the case manager feels a home visit would be beneficial

Assessment	Interventions
Family's verbal understanding of lead poisoning, and prevention	Reinforce previous health education

Assess barriers to patients ability to keeping appointments, refer as appropriate	Stress importance of monitoring blood lead levels every 1–2 months or as ordered by the physician for confirmed lead poisoning cases and every 3 months for 10–14 micrograms per deciliter.
Patient's physical status.	Provide health education and referral, if indicated.
Patients blood lead level status.	Collect blood and/or schedule a clinic appointment, if indicated. (Coded "Screening" or "Confirmatory" sample. "Medical Follow-up" if child has been confirmed.)
Home environment: determine whether temporary measures are continuing.	Reinforce previous recommendations. Provide education, as indicated.
Determine whether permanent measures have occurred/are planned.	Stress importance of workers using safety precautions and appropriate clean-up procedures during abatement. Encourage pregnant women and children to be kept away from work areas. While extensive work is being done, it is preferable to move the family out of the home.

CASE CLOSURE

Case closure is determined according to the initial blood lead level and can be closed as follows:

BLL 10-14.9 µg/dL – Case closure is when BLL is less than 10µg/dL, repeat BLL as indicated.

BLL 15µg/dL and greater– Case closure is when BLL is less than 10µg/dL for at least 6 months; environmental hazards have been addressed; and there are no new environmental hazards.

When a child is closed to follow-up, according to PPHR guidelines, the date and reason for case closure, and any actions/interventions or comments should be recorded on the case management report in area provided.

A case may also be designated as *administrative closure* if all directives, as enumerated in the "Follow-up/Internal Tracking/Referral" section of the PPHR, have been completed. The case manager must follow all procedures for closure in a 'lost to follow up' case closure.nal (If a case has been closed and at a later date is reopened, send a new Initial Report Form with initial BLL and updated information. Please do not continue on old file and write reopened.)

For prenatal lead exposure, case closure ends for the pregnant woman at delivery of the infant. If the BLL is >25µg/dL, follow-up will be with the patients PCP. The newborn will need to be tested at delivery. A cord blood sample is to be used for testing at the time of delivery. Protocols for case management will be initiated for newborns with BLL's ≥10µg/dL.

A case may also be designated as *administrative closure* if all directives, as enumerated in the "Follow-up/Internal Tracking/Referral" section of the PPHR, have been completed. The case manager must follow all procedures for closure in a 'lost to follow up' case closure.nal (If a case has been closed and at a later date is reopened, send a new Initial Report Form with initial BLL and updated information. Please do not continue on old file and write reopened.)

Forms available @ <http://chfs.ky.gov/dph/info/dpqi/PPHR.htm>. and then go to Forms and Teaching Sheets and in this section go to Lead/ Report and Home Visit Forms/Onsite Visual Investigation Form.

The home visit, follow-up home visit and visual evaluation forms, when completed, should be filed at the county local health department in the patient's chart and a copy will be mailed or faxed to the state *HHLPPP NCI*

Mail to: **Healthy Homes and Lead Poisoning Prevention Program**
 Division for Maternal and Child Health
 275 East Main Street, HS2GWA
 Frankfort, Kentucky 40621
Or Fax to: **(502) 564- 5766**

Resources:

“Lead Poisoning: Are Your Children at Risk?”
“Lead Poisoning and Your Children”
“Protect Your Children from Lead in Your Home”
“Fight Lead Poisoning with a Healthy Diet”
“Lead Paint Safety”

“Preventing Lead Exposure in Young Children” www.epa.gov/lead
www.cdc.gov/niosh
www.putthelidonlead.org
“Prevent Lead Poisoning, Eat Healthy”

Manuals:

1. *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials.* (CDC, 1997)
2. *Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention.* (CDC, 2002)

BLOOD LEAD SPECIMEN COLLECTION GUIDELINES

When collecting blood lead specimens, please refer to the laboratory used by your local health department and follow their correct collection guidelines.

CDC Guidelines for collecting and handling blood lead samples:
http://www.cdc.gov/nceh/lead/training/blood_lead_samples.htm.

Medtox website for Guideline for collecting and handling blood lead samples video: www.Medtox.com, go to Medical testing, go to Filter paper testing, go to view collection video.

Attention: Steps performed before, during, and after collection are of paramount importance.

- Lead is everywhere in the environment. Therefore, great care must be taken to remove lead from the hands of the patient and collector prior to collection. It will also prevent contamination of your collection site and work environment. Prepare your worksite in a sterile fashion prior to washing patients and your own hands for the specimen blood draw.
- It is recommended for screening children who are younger than one (1) year of age to use the heel of the infant as a puncture site. Guidelines for this procedure can be found at the National Committee on Clinical Laboratory Standards.

NOTE: The finger stick collection technique is more prone to environmental contamination than the venous and will affect specimen results. Special precautions are needed to prevent contamination.

CDC recommends confirmation on all lead poisoned results with a venous specimen.

Contamination errors are common in trace metal analysis, so precautions must be taken to eliminate or reduce them. Lead can be picked up by accident from work surfaces, from printed materials or from the hands of the collector. It can also come from the hands and the clothes of the child you are screening. The key to effective lead screening is to collect specimens that have not been contaminated.

To reduce the odds of contaminating your sample:

- Take special care when preparing your test area and supplies, use sterile fashion.
- As much as possible, use only supplies that have been certified as lead free.
- Label the liquid soap bottle that will be used for lead testing, “Use for Lead Testing Only”.
- Handle all equipment with powder-free gloves. Powdered gloves may contaminate your sample.
- Keep all screening supplies—which include your lancet, gauze pads, band aids, tissues, alcohol pads, and micro-collection vials—in a clean plastic box with a snap lid for storage.
- When using bulk-packaged micro-collection vials, carefully pour the vials into a re-sealable plastic bag and close to store. Individually packaged kits or a full box of micro-collection vials can be stored as they are. All micro-collection containers from open packages should be stored in a covered plastic container.
- There are many types of micro-collection vials you can use to collect samples, but all must be prescreened or **certified as lead-free**.
- For Capillary tubes, most vials contain 200 to 300 micrograms per deciliter of blood, EDTA or Heparin tubes are required.
- For Capillary Scoop micro-collection vials, these should be used with extreme caution because they have a high potential for contributing to lead and tissue contamination.
- Choose a lancet with the appropriate depth to collect the proper amount of blood for the micro-collection vial you are using. Also, use retractable lancets that cannot be used more than once to avoid sticking a child unnecessarily

Practice universal precautions and wear protective equipment.

Specimen Collection Technique

Preparing the Collection Area:

Before you begin, fill out your laboratory request form completely and write the child's name on the vial label or front of filter paper collection Card by applying bar-coded sticker from requisition into box on card, or writing name and patient ID number on card. **NOTE: Information must match the requisition and cards without label or identifying information will NOT be tested.**

- Information required for lab reporting and should be placed on lab requisitions include:
First Name, Last Name, Middle Initial, Date of Birth, Patient address, City, State, Zip code, Social Security #/ Medicaid/Passport #, Child/Prenatal/Adult, and collection date.
- Prepare your collection area with a clean, disposable pad in a sterile fashion as to keep area contamination free and always have the following on hand:
 - Two gauze pads
 - Two alcohol pads
 - A self sheathing lancet
 - A micro collection vial or filter paper
 - Specimen identification label
 - Liquid soap
 - Bandages
 - Biohazard bag
 - Accessible sharps container

It's important that the technician/ nurse responsible for obtaining the blood sample is familiar with the techniques for obtaining a high quality blood lead sample, see CDC video at http://www.cdc.gov/nceh/lead/training/blood_lead_samples.htm

Capillary/Finger Stick Technique

1. The nurse should help the child **thoroughly** wash their hands (or foot) with soap and water, as the collector is also washing their hands, paying special attention to the fingertips and under the finger nails and on nail beds, (absolutely do not use gel type sanitizers). If the child will not let the nurse wash their hands, the parents should thoroughly wash their own hands and then the child's hands, again paying attention to area of the nails.
 2. Rinse hands thoroughly.
 3. Since recycled and colored towels may have traces of lead, it's best to let hands **air dry** or use white, **lead free towels**.
 4. To avoid contamination do not let the child's fingers touch any surface, you may need to hold the child's hand in a gauze or paper towel until you get to your work area.
 5. Although you can draw a sample from any finger, we suggest working with the ring finger. The ring finger is less calloused and somewhat less sensitive. Plus, it's easy to palpitate above the puncture to produce and increase blood flow.
 6. Massaging the child's hand and the lower part of the finger before you make your puncture will calm the child and stimulate blood flow.
 7. Clean the finger that you will puncture with an alcohol pad. If you see dirt on the pad, **use a new alcohol pad until clean**.
 8. Allow finger to air dry or wipe dry with sterile gauze. NOTE: **If alcohol remains on the finger, it will prevent the blood from forming a well-rounded drop and will contaminate the sample.** Wiping will also prevent alcohol from getting into the cut and stinging. Remember to keep the finger isolated from the rest of the hand.
 9. When you are ready for blood collection, hold the child's finger in a downward position.
 10. Use the appropriate blade and lance the palm side of the finger. Do not lance the side or the tip.
 - a. **Correct finger stick Puncture** across grooves of fingerprint; a round drop of blood will form
 - b. **Incorrect finger stick:** Puncture parallel to grooves of fingerprint; blood runs down finger; will not form into a drop.

This enables the blood to form as a drop on the fingertip. If the puncture is parallel to the lines of the fingerprint, the blood will not form as a drop but will run down the finger making correct collection impossible.
 11. Promptly blot the first drop of blood on a gauze pad and discard in the appropriate container. The **first drop of blood is likely to contain excessive tissue fluid that can alter test results**.
 12. To collect a droplet of blood, keep the child's finger in a downward position and gently massage it to maintain blood flow. If blood flow is inadequate, gently massage the child's
-

finger to stimulate more flow, but don't squeeze the finger because tissue fluid may dilute the sample. Avoid strong, repetitive pressure and do not scrape the finger during collection.

Capillary Tubes/Vial Collection

- Hold the micro-collection tube at a 10 degree angle below the collection line. Touch the tapered end of the tube into the droplet of blood and not directly on the skin. Capillary action will cause the blood to fill the tube. As the blood starts entering the capillary tube, be careful not to allow air bubbles to enter. You will need to collect your sample within **two minutes** to avoid clotting.
- Also avoid collecting smeared blood or blood that has run into the cuticle or nail area.
- Depending on the micro-collection vial you use, the amount of blood you collect will vary. **Fill tube to the appropriate line** in order to have both the correct anticoagulant-to-blood ratio and to supply a sufficient amount of blood to the lab for testing.
- **Seal** the micro-collection vial and gently **invert the container 7 to 10 times** to prevent clot formation. Clots can render the specimen unsuitable for testing.
- Carefully place the child's identification label on the micro-collection vial vertically. If the label is not fixed vertically, the laboratory will not be able to read it.

Filter Paper Collection

Lead testing requires that *a SINGLE large drop of blood FREELY falls* and is absorbed uniformly by the filter paper. Do not scrape, smear, smudge, wipe or touch finger or blood to the filter paper, these specimens will be rejected.

Collect **at least two large, separate blood drops** that:

- Evenly saturate the filter paper, i.e., the spot will appear the same on front and back of the paper (see examples, p. 2 on Medtox Guideline examples). Evaluate the sample collection. Examine the back side of the filter paper to ensure that the blood has soaked evenly through to the paper. If NOT acceptable, repeat finger stick and recollect sample on a new sample card.
 - Are about the size of the black circles ($\frac{1}{2}$ inch diameter). **NOTE: Blood spots do NOT have to be within the black circles but must be large enough for testing (2 spots with minimum $\frac{3}{8}$ inch diameter).** If drops are **free falling**, the drop will be large enough to read, do not touch blood or finger to paper.
 - **NEVER put a 2nd drop of blood on top of a spot of blood already on the paper** (i.e., multiple drops), which makes the collection unacceptable for testing and will be cancelled as a smear, non-homogeneous, or unsuitable (see examples, p. 2 on Medtox examples).
 - If a **hemoglobin test** is also requested, a 3rd **acceptable** free falling blood spot is required. A "HGB" circle is provided as a guide on the white Pediatric Lead/Hemoglobin blood sample card, however can be anywhere in the collection area as long as it does not overlap another blood drop.
 - **Dry collection Card:** Allow the opened collection Card to air dry for **at least 2 – 5 minutes**.
-

- Place the dry card into a plastic bag and seal. NOTE: Samples received wet **CANNOT** be tested—occurs when cards are immediately placed into plastic bag or when filter paper is saturated with too much blood. Please let these cards dry.

13. Ship specimen promptly per protocol of the laboratory.

When the child's blood level results are received from the laboratory, consult PHPR Lead section for intervention guidelines according to blood lead results.

Targeted Zip Codes

Adair		Breckinridge		Edmonson		Graves		Henry
42715		40170		42275		42040		40007
42742				42285		42061		40058
42761		Calloway						
		42076		Elliott		Grayson		Hopkins
Allen				41171		42762		42408
42153		Campbell						42410
		41071		Estill		Green		
Ballard		41073		40336		42743		Jackson
42060		41074		40472				40447
		41085				Greenup		40486
Barren				Fayette		41174		
42160		Carlisle		40508				Jefferson
		42021				Hardin		40202
Bath		42023		Fleming		40155		40203
40374				41049		40177		40204
		Carter						40205
Bell		41146		Floyd		Harlan		40206
40845				41605		40801		40208
40902		Casey		41606		40807		40209
40958		42528		41607		40810		40210
40977		42539		41612		40815		40211
40988				41615		40819		40212
		Christian		41619		40820		40213
Bourbon		42266		41630		40823		40215
40348		42254		41635		40828		40217
40361				41636		40830		
		Clay		41640		40831		Johnson
Boyd		40914		41649		40843		41216
41101		40941		41650		40854		41219
		40972		41651		40855		41222
Bracken		40983		41653		40863		41228
41002				41660		40870		41238
41004		Clinton		41666		40873		41240
		42602		41669				41254
Breathitt						Hart		41255
41317		Crittenden		Fulton		42722		41257
41339		42064		42041		42729		41260
41385				42050		42749		41263
		Cumberland						41265
		42759		Garrard		Hickman		41268
Kenton				40461		42031		41274

41011		Lee		Magoffin		Muhlenberg		Pike
41014		41311		41426		42374		41514
41015		41397		41464		42321		41524
41016				41465		42332		41543
		Letcher		41632		42339		41546
Knott		40826						41549
41740		40862		Martin		Ohio		41553
41822		41537		41203		42333		41555
41843		41819		41224		42338		41563
41844		41825		41250		42343		41564
41759		41826		41262		42369		41567
41772		41833		41267				41569
41817		41835				Owen		
41834		41855		Mason		40355		Todd
41839		41810		41055				42204
41859		41840		41056		Owsley		
		41845				41314		Warren
Knox		41849		Meade		41364		42170
40734				40104		41386		
40771		Lewis		40176				Wayne
40903		41135				Pulaski		42633
40906		41170		Meniffee		42501		42632
40935		41179		40322		42544		
40953				40346		42553		Webster
40982		Lincoln		40387				42450
40995		40448				Wayne		42463
40997				Mercer		42633		42403
		Livingston		40310		42632		
Lawrence		42047						Whitley
41124				Metcalf		Perry		40759
41159		Logan		42129		41367		40763
41230		42265		42154		41701		40769
						41712		
Leslie		McCreary		Monroe		41723		Wolfe
40827		42647		42167		41778		41301
40858		42653		42157		41735		41332
40874		42638		42140		41751		41365
41714				Morgan		41773		
41730		McLean		41408				
41762		42371		41421		Robertson		
41775				41425		41064		
41776		Marion						
		40009		Nelson		Rowan		
		40328		40008		40313		

Appendix B: Lead Management Home Visit

LEAD MANAGEMENT HOME VISITS

An initial home visit by a nurse is required for all children receiving services in a health department clinic with a second blood lead level remaining at 15µg/dl or a confirmed blood lead levels of 20µg/dL or above. An environmental inspector must also visit the child's home, with the nurse if possible, to conduct an environmental assessment to identify sources of lead exposure. Follow-up home visits may additionally be made, at the discretion of the nurse or environmentalist, to monitor the blood lead status of the child and/or to evaluate the home.

Environmental home assessments:

- The health department nurse is responsible for referring all children receiving services in a health department clinic with a confirmed blood lead level of 20 µg/dL or above to a person certified to perform a risk assessment.
- A private provider or the parent or guardian may refer children receiving services in the private sector.
- The health department is also responsible for conducting an environmental assessment for children with a confirmed blood lead level of 20 µg/dL or above, when referred to the health department by a private provider or the parent or guardian.

The home visit by the nurse and the environmental assessment should occur according to the timeframe specified below. Consult the Home Visitation Form in the Forms Section.

NEED	ASSESSMENT	INTERVENTION/FOLLOW-UP
Initial home visit: <ul style="list-style-type: none">• 70 µg/dL and above within 24 hours.• 45–69 µg/dL within 48 hours.• 20–44 µg/dL within 1 week. 2 specimens at a level of 15–19 µg/dL (make home visit and refer to environmentalist) The initial home visit (home visit other than evaluation and management visit) usually lasts 31 or more minutes.	Family's awareness of the child being lead poisoned and level of understanding. Who is providing primary and acute health care? Child's physical status, including behavior problems/changes, nutritional status and specific habits such as placing fingers in mouth or eating dirt or paint chips. Home environment: determine whether dwelling was built prior to 1978, the general condition of the house/apartment and the level of housekeeping/cleanliness.	Inform family of the child's lead status, what lead poisoning is, the effect of lead, and the importance of monitoring blood lead levels at least every 1–2 months or as indicated by physician. Assist family in scheduling an appointment for a medical evaluation for lead poisoning and an appointment for preventive health care if indicated. Provide health education and referrals, as indicated. Stress importance of high iron, high calcium, low fat diet, and the importance of washing child's hands and toys frequently. Explain common sources of lead and ways to immediately reduce exposure such as cleaning with detergent, covering chipping paint with tape or plastic, and restricting child from playing in a hazardous area. If an environmentalist is initially unavailable for a visit, tell the family that one should soon come to assess the house for additional potential sources of lead. (A person certified to perform lead risk assessments must make visits in homes with children having blood lead levels of ≥ 20 µg/dL)

LEAD MANAGEMENT HOME VISIT

(continued)

NEED	ASSESSMENT	INTERVENTION/FOLLOW-UP
<p>Follow-up Visit</p> <p>(indicated for children not returning to clinic for blood lead monitoring, and children with blood lead levels which remain high, increase or do <u>not</u> decline over time)</p> <p>The follow-up visit (other than evaluation and management visit) usually lasts 16–30 minutes.</p>	<p>Family's understanding of lead poisoning.</p> <p>Whether appointments are being kept.</p> <p>Child's physical status.</p> <p>Child's blood lead level status.</p> <p>Home environment: determine whether temporary measures are continuing.</p> <p>Determine whether permanent measures have occurred/are planned.</p> <p>Determine if interim controls may help lower child's lead level.</p>	<p>Reinforce previous health education.</p> <p>Stress importance of monitoring blood lead levels every 1–2 months or as ordered by the physician (for confirmed cases, 3–4 months for others 10–19 µg/dL).</p> <p>Provide health education and referral, if indicated.</p> <p>Collect blood and/or schedule a clinic appointment, if indicated. (Coded "Screening" or "Confirmatory" sample. "Medical Follow-up" if child has been confirmed.)</p> <p>Reinforce previous recommendations.</p> <p>Provide education, as indicated.</p> <p>Stress importance of workers using safety precautions and appropriate clean-up procedures during abatement.</p> <p>Encourage pregnant women and children to be kept away from work areas. While extensive work is being done, it is preferable to move the family out of the home.</p>

Resources:

www.epa.gov/lead
 "Lead Poisoning and Your Children"
 "Protect Your Children from Lead in Your Home"
 "Fight Lead Poisoning with a Health Diet"
www.cdc.gov/niosh
 "Lead Paint Safety"
 "Preventing Lead Exposure in Young Children"
www.putthelidonlead.org
"Lead Poisoning: Are Your Children at Risk?"
"Prevent Lead Poisoning Eat Healthy"

Manuals:

1. *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials.* (CDC, 1997)
2. *Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention.* (CDC, 2002)

Appendix C: Initial Home Visit Procedure

Lead Case Management Home Visit Form (Initial Home Visit)

Purpose:

To identify areas in the home that could potentially be a source for lead exposure.

To provide suggestions and educational materials to the family in an effort to make the home lead safe

To reduce the child's current blood lead level to less than 10µg/dL by reducing or eliminating the amount of lead exposure

To assure that all children in the state of Kentucky with a blood lead level of 15µg/dL or above receive timely and appropriate care.

Procedure

1. The initial home visit will be initiated by the local health department lead case manager at the following times:
 - a. after a second elevated blood lead level at 15-19µg/dL on a child six years of age or younger
 - b. after a confirmed elevated blood lead level at or above 20µg/dL on a child six years of age or younger
2. The initial home visit will be made according to the following time frames:
 - a. a second blood lead level at 15-19µg/dL within 2 weeks
 - b. a confirmed blood lead level at 20-44µg/dL within 1 week
 - c. a confirmed blood lead level at 45-69µg/dL within 48 hours
 - d. a confirmed blood lead level at 70µg/dL or higher within 24 hours
3. The initial home visit form should be completed in the home by the lead case manager.
4. The initial home visit form, upon completion, will be filed at the local health department and a copy will be mailed or faxed to the state *Childhood Lead Poisoning Prevention Program* case manager.

Mail to: **Lead Case Manager
Childhood Lead Poisoning Prevention Program
Division of Adult & Child Health Improvement
275 East Main Street, HS2GWA
Frankfort, Kentucky 40621**

Fax to: **(502) 564-8389**

Appendix D: Initial Home Visit Form

Lead Case Management Home Visit

Health Dept. _____ County _____
Case Manager _____ Phone # _____
Patient Name _____ D.O.B. _____
Address _____

Initial Home Visit

(Any child with a BLL of 15µg/dL or above)

Date _____

	yes	no	n/a
Parent/guardian informed of patient's lead level?			
Explained to parent/guardian what lead poisoning is?			
Explained to parent/guardian the effects of lead poisoning?			
Stressed the importance of monitoring blood lead levels at least every 1-2 months or as ordered by the PCP?			
Appointment scheduled for Medical Evaluation?			
Appointment scheduled for preventive health care?			
Appointment made for Medical Nutritional Counseling?			
Talked to parent/guardian about the importance of a healthy diet, high in calcium, high in iron, high in vit.C, & low in fat?			
Talked to parent/guardian concerning the importance of washing child's face & hands frequently, especially before meals or snacks?			
Talked to parent/guardian concerning the importance of washing the child's toys frequently?			
Explained common sources of lead and ways to immediately reduce exposure such as cleaning with detergent, covering chipping paint with tape or plastic, & restricting child from playing in a hazardous area?			
Pamphlets given to parent/guardian? Please list pamphlets given _____ _____ _____			
Environmental Home Visit scheduled?			
Environmental Risk Assessment scheduled?			

Comments _____

Case Manager/Nurse Signature _____

Appendix E: On-site Visual Evaluation Procedure

*Lead Case Management On-site Visual Evaluation Form Environmental/Lead Case Manager

Purpose:

To identify areas in the home that could potentially be a source for lead exposure.

To provide suggestions and educational materials to the family in an effort to make the home lead safe.

To reduce the child's current blood lead level to less than 10µg/dL by reducing or eliminating the amount of lead exposure.

To assure that all children in the state of Kentucky with a blood lead level of 15µg/dL or above receive timely and appropriate care.

Procedure:

1. The local health department lead case manager, upon determining that a visual evaluation is necessary, will contact the environmentalist.
2. The environmentalist and the lead case manager will work together to set up a time (within the proper time frames) for the visual evaluation.
Time frames:
 - a. a second blood lead level at 15-19µg/dL within 2 weeks
 - b. a confirmed blood lead level at 20-44µg/dL within 1 week
 - c. a confirmed blood lead level at 45-69µg/dL within 48 hours
 - d. a confirmed blood lead level at 70µg/dL or higher within 24 hours
3. The visual evaluation form will be completed in the home by the environmentalist.
4. The visual evaluation form, upon completion, will be filed at the local health department and a copy will be mailed or faxed to the state *Childhood Lead Poisoning Prevention Program* case manager.

Mail to: Lead Case Manager

**Childhood Lead Poisoning Prevention Program
Division of Adult & Child Health Improvement
275 East Main Street, HS2GWA
Frankfort, Kentucky 40621**

Fax to: (502) 564-8389

*(If the environmentalist is unable to make the home visit for the visual evaluation, the case manager may complete this form.)

Appendix F: On-Site Visual Evaluation Form

*Child with an Elevated Blood Lead Level

Onsite Visual Evaluation of Residence

Health Department _____ County _____
Name of Child _____ Sex _____ Birth Date _____
Address _____
Parent's Name _____ Phone # _____
Environmentalist _____ Phone # _____
Case Manager _____ Phone # _____
Date of Visual _____
Lat/Long: _____

General Information:

1. Do you rent or own (circle one)?
2. Are there any subsidies? ☐ Yes ☐ No
If yes, what type? ☐ Section 8 ☐ Federal Rent Subsidy ☐ Other _____

Landlord Information: Name _____
Address _____
Phone # _____
Alt. Phone # _____

3. Year house was built _____
4. Have there been any recent remodeling of repairs inside or outside the residence?
☐ Yes ☐ No If Yes, discuss _____

5. When did your family move into this home?

Please complete for the previous addresses for the past 12 months

Dates	Address	Age of Dwelling (if known)	General condition of dwelling— including any remodeling/renovation.

Appendix F: Continued

6. Is the child cared for away from the home? ☐ Yes ☐ No

If yes list the name of the contact and their relationship to the child, their address, the number of hours a week the child is at this address and the general condition of the home.

Contact Name/ type of relation	Address	# hours per week (approx.)	General condition of dwelling—including any remodeling/renovation.

Children's Testing and Results (all known in home):.

Name	Age	Date	Location*	Type*	Result

*Type – (C) Capillary or (V) Venous*Location – Health Department, Physician's Office, etc

Appendix F: Continued

Has the child been referred to a physician? Yes No

If Yes, physician's name _____ Phone # _____

Indicate any medical treatment, including physician and hospital visits:

Water Lead Hazards

1. Source of drinking water? ☐ Municipal ☐ Private Well ☐ Cistern
☐ Other _____
2. Location of faucets where family obtains drinking water?
☐ Kitchen ☐ Bathroom ☐ Other _____
3. Is tap used to prepare drinks for children? ☐ Yes ☐ No If Yes, describe _____

4. Has new plumbing/pipes been installed within the last 5 years? ☐ Yes ☐ No

Lead in Soil Risk Factors

1. Any lead industries near the residence? ☐ Battery Plant ☐ Radiator Repair
☐ Soldering Industry ☐ Other _____
2. Approximate distance of the residence from the street or roadway _____
3. Are there any nearby buildings or structures being (pick one)
☐ renovated ☐ repainted ☐ demolished ☐ NA
Describe.

4. Are there visible paint chips in the soil? ☐ Yes ☐ No If yes, describe

Appendix F: Continued

Occupational/ hobby Lead Risk Factors

Where do adult family members work?

Name: _____
Place of Employment: _____
Job Duties: _____

Name: _____
Place of Employment: _____
Job Duties: _____

Indicate Family Members Activities That May Cause Lead Exposure

Work	Hobbies	Activity
<input type="checkbox"/>	<input type="checkbox"/>	Paint Removal
<input type="checkbox"/>	<input type="checkbox"/>	Chemical Stripper
<input type="checkbox"/>	<input type="checkbox"/>	Remodeling or Repairing Buildings
<input type="checkbox"/>	<input type="checkbox"/>	Plumbing
<input type="checkbox"/>	<input type="checkbox"/>	Repairing Radiators
<input type="checkbox"/>	<input type="checkbox"/>	Melting Metal for Reuse (smelting)
<input type="checkbox"/>	<input type="checkbox"/>	Welding, Burning, Cutting, or Torch work
<input type="checkbox"/>	<input type="checkbox"/>	Pouring Molten Metal (Foundries)
<input type="checkbox"/>	<input type="checkbox"/>	Auto Body Repair Work
<input type="checkbox"/>	<input type="checkbox"/>	Working at a Firing Range
<input type="checkbox"/>	<input type="checkbox"/>	Making/Salvage Batteries
<input type="checkbox"/>	<input type="checkbox"/>	Making Paint or Pigments
<input type="checkbox"/>	<input type="checkbox"/>	Painting Salvaging Metal or Batteries
<input type="checkbox"/>	<input type="checkbox"/>	Making or Splicing Cable or Wire
<input type="checkbox"/>	<input type="checkbox"/>	Making Explosives or Ammunition
<input type="checkbox"/>	<input type="checkbox"/>	Making or Repairing Jewelry
<input type="checkbox"/>	<input type="checkbox"/>	Making Pottery
<input type="checkbox"/>	<input type="checkbox"/>	Building, Repairing, or Painting Ships
<input type="checkbox"/>	<input type="checkbox"/>	Working in a Chemical Plant
<input type="checkbox"/>	<input type="checkbox"/>	Working at a Glass Factory
<input type="checkbox"/>	<input type="checkbox"/>	Working at an Oil Refinery
<input type="checkbox"/>	<input type="checkbox"/>	Use of Artists Paints to Paint Pictures or Jewelry
<input type="checkbox"/>	<input type="checkbox"/>	Reloading or Melting Lead to Make Bullets or Fishing Sinkers

Probable Lead Exposure: ☐ Yes ☐ No

Child Behavior and Environmental Risk Factors

1. Where does the child like to play outdoors? _____
 2. Type of surface in the child's primary outdoor play area? _____
 3. Where does the child like to play indoors? _____
 4. Does child suck his/her fingers? ☐ Yes ☐ No
 5. Does child put objects into his/her mouth? ☐ Yes ☐ No If yes what types of objects?

 6. Does child chew on any surfaces or other household items? ☐ Yes ☐ No If yes what surfaces or items? _____
-

Appendix F: Continued

7. Does child have a favorite cup or eating utensil? ☐ Yes ☐ No

If yes, is it ceramic or painted? ☐ Yes ☐ No

8. Are any of the child's toys painted? ☐ Yes ☐ No

9. Does the child take baths in a porcelain bathtub? ☐ Yes ☐ No

If yes, is it chipping or peeling? ☐ Yes ☐ No

Other Household Risk Factors

1. Does the family ever use any home remedies or herbal treatments? ☐ Yes ☐ No

If yes, what are they? _____

2. Does anyone in the family use hair dyes? ☐ Yes ☐ No

If yes, what brands are being used? _____

3. Are any liquids stored in metal, pewter or crystal containers? ☐ Yes ☐ No

If yes, what liquids and containers? _____

4. What type of container (i.e. aluminum, iron, stainless steel, ceramic) is used to prepare the families food?

5. Does the family use imported canned items? ☐ Yes ☐ No If yes, explain

If there is deteriorated paint on the interior or exterior surfaces of the residence, please indicate:

Interior Building Component	Chipping or Peeling	Specific Location (i.e. bedroom, kitchen, etc.)
Doors		
Door Casings		
Window Sills		
Window Wells		
Window Casings		
Baseboards		
Other Trim		
Stairs or Railings		
Cabinets		
Floors		
Other Surfaces		

Exterior Building Component or Structures	Chipping or Peeling	Specific Location (i.e. front, back, side, etc)
Doors		
Door Casings		
Windows		
Siding		
Porch Floors		
Other Porch Surfaces		
Trim		
Fences		
Play Structures		
Garage		
Other Surfaces		

Signature _____

(Case Manager/Nurse or Environmentalist)

*(If environmentalist is not available for home visit, the lead case manager may fill out this form)

Appendix G: Follow Up Home Visit Procedure

Lead Case Management Home Visit Procedure (Follow-up Home Visit)

Purpose:

To reduce the child's current blood lead level to less than 10µg/dL by reducing or eliminating the amount of lead exposure.

Assessment of home environment to assure temporary measures for lead safety are continuing.

To assure that all children in the state of Kentucky with an elevated blood lead level receive timely and appropriate care.

Procedure:

1. The follow-up home visit will be initiated by the local health department lead case manager when any of the following occur:
 - a. failure of child to return for blood lead monitoring
 - b. blood lead levels remain elevated
 - c. blood lead levels are increasing
 - d. at any other time the case manager feels a home visit would be beneficial
2. The follow-up home visit will be completed in the home by the local health department lead case manager.
3. The follow-up home visit form, upon completion, will be filed at the local health department and a copy will be mailed or faxed to the state *Childhood Lead Poisoning Prevention Program* case manager.

Mail to: **Lead Case Manager**
Childhood Lead Poisoning Prevention Program
Division of Adult & Child Health Improvement
275 East Main Street, HS2GWA
Frankfort, Kentucky 40621

Fax to: **(502) 564-8389**

Appendix H: Follow Up Home Visit Form

Lead Management Home Visit Case Managers

Follow-up Home Visit

(Any child who does not return for blood lead monitoring, & children with blood lead levels which remain high, increase or do **not** decline over time.)

Date_____

Reason:

Did not return for BLL monitoring_____

BLL remains elevated_____

BLL is increasing_____

Other_____

	yes	no	n/a
Parent/guardian understands lead poisoning & the effects lead poisoning can have on their child?			
Previous teaching reinforced?			
Temporary measures for lead safety (tape over chipping paint, cleanliness of home, cleanliness of child & child's toys, etc.) are continuing?			
Home remodeling taking place, or has occurred?			
If home remodeling is taking place, are the children____/pregnant women____ being kept away from work areas?			
Child scheduled for repeat BLL at HD____, PCP____, Clinic____, other____. (if other) specify_____.			
Blood specimen collected for pb level in home. (Capillary____ Venous____)			

Comments

Signature_____

Appendix I: Monthly Report Form Procedure

Case Management Monthly Report Form

Purpose:

To coordinate communication between the local health departments lead case managers and the state *Childhood Lead Poisoning Prevention Program* case manager in an effort to assure that all children in the state of Kentucky with a blood lead level of 10µg/dL or greater receive appropriate and timely care.

Procedure:

1. A case management report will be initiated by the lead case manager in each county of a local health department when a child's blood lead level is equal to or greater than 10µg/dL.
2. The initial case management report will be filled out with all demographics and actions/interventions as soon as the health department case manager becomes aware of a child with a blood lead level of 10µg/dL or greater.
3. The initial case management report, upon completion, will be filed at the local health department and a copy will be mailed or faxed to the state *Childhood Lead Poisoning Prevention Program* case manager.

Mail to: **Lead Case Manager**
Childhood Lead Poisoning Prevention Program
Division of Adult & Child Health Improvement
275 East Main Street, HS2GWA
Frankfort, Kentucky 40621

Fax to: **(502) 564-8389**

4. The report will be updated at appropriate times following PHPR guidelines on the Lead Classification Chart. (example: Child's blood lead level is 16µg/dL. According to the PHPR guidelines on the Lead Classification Chart, this child would have a repeat blood lead level in 12 weeks. On the Monthly Report the case manager would document the date the repeat blood lead level was obtained, the results of that blood lead level, and any actions or interventions that were done.)
 5. At the end of each month a copy of all initial, and any updated lead case management reports will be filed at the local health department, and a copy will be mailed or faxed to the state childhood lead poisoning prevention case manager.
 6. When a child is closed to follow-up, according to PHPR guidelines, the date of case closure and any actions/interventions or comments should be recorded on the case management report. The case management report will then be filed at the local health department and a copy mailed or faxed to the state *Childhood Lead Poisoning Prevention Program* case manager at the end of the month along with the other lead case management reports.
-

Appendix J: Monthly Report Form

Childhood Lead Poisoning Prevention Program Monthly Report

Health Dept. _____ County _____

Case Manager _____ Phone# _____

Patient Name _____ D.O.B. _____

Patient Address _____

Parent/Guardian _____ Phone # _____

Physician _____ Phone # _____

Date of Initial BLL _____ Results _____ venous _____ capillary _____

Date of Confirmatory BLL _____ Results _____ v _____ c _____

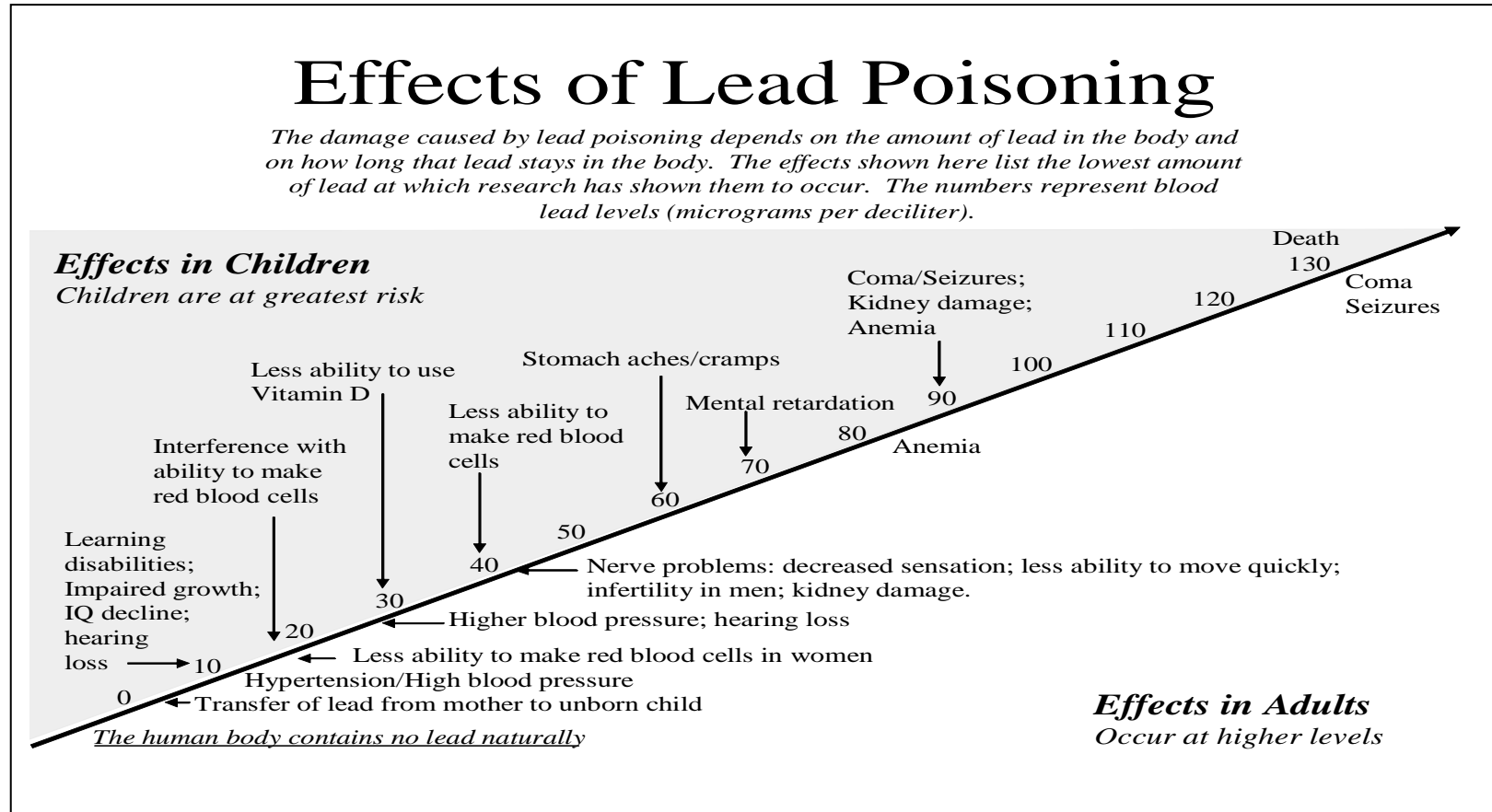
Actions/Interventions	Date	N/A
Letter to parent/guardian with educ. info. on lead poisoning		
Home visit scheduled for: Visual Inspection____, Confirmed EBL____, Other____ (Nurse____, Environmentalist____, Case Manager____)		
Scheduled for Medical Nutrition Therapy		
Referred to Primary Care Physician for Medical Follow-Up		
Referred to Primary Care Physician____, Specialist____, for medical evaluation & possible chelation.		
Referred to Primary Care Physician for Physical Exam and IMM.		
Referred to a certified risk assessor for risk assessment		
Follow-up BLL scheduled		

Lead Hazards Identified: yes ____ no ____ If yes, list hazards _____

Family Relocated: yes ____ no ____ Relocation Address _____

Date	F/U pb Test Results	Actions/Interventions/Comments

Appendix K: Effects of Lead Poisoning Graphic



Appendix L: Verbal Risk Assessment

VERBAL RISK ASSESSMENT FOR LEAD POISONING

The following situations may create lead exposure for a child and are included on the Social History and the Medical History. Review each of these questions at each preventive health visit for all children ages 6 months to 6 years. Document in each child's medical record at every visit that the assessment was done, any positive response(s) and action taken.

1. Does child live in or visit a building built before 1978 with peeling/chipping paint or with recent or ongoing remodeling?
2. Does child have a brother/sister/playmate who has or did have lead poisoning?
3. Do you (or a family member) work on a farm; in a bridge, tunnel, or high construction area; with batteries; ammunition, or visit a firing range?
4. Do you use any folk remedies that may contain lead or use pottery or ceramic ware for cooking, eating, or drinking?

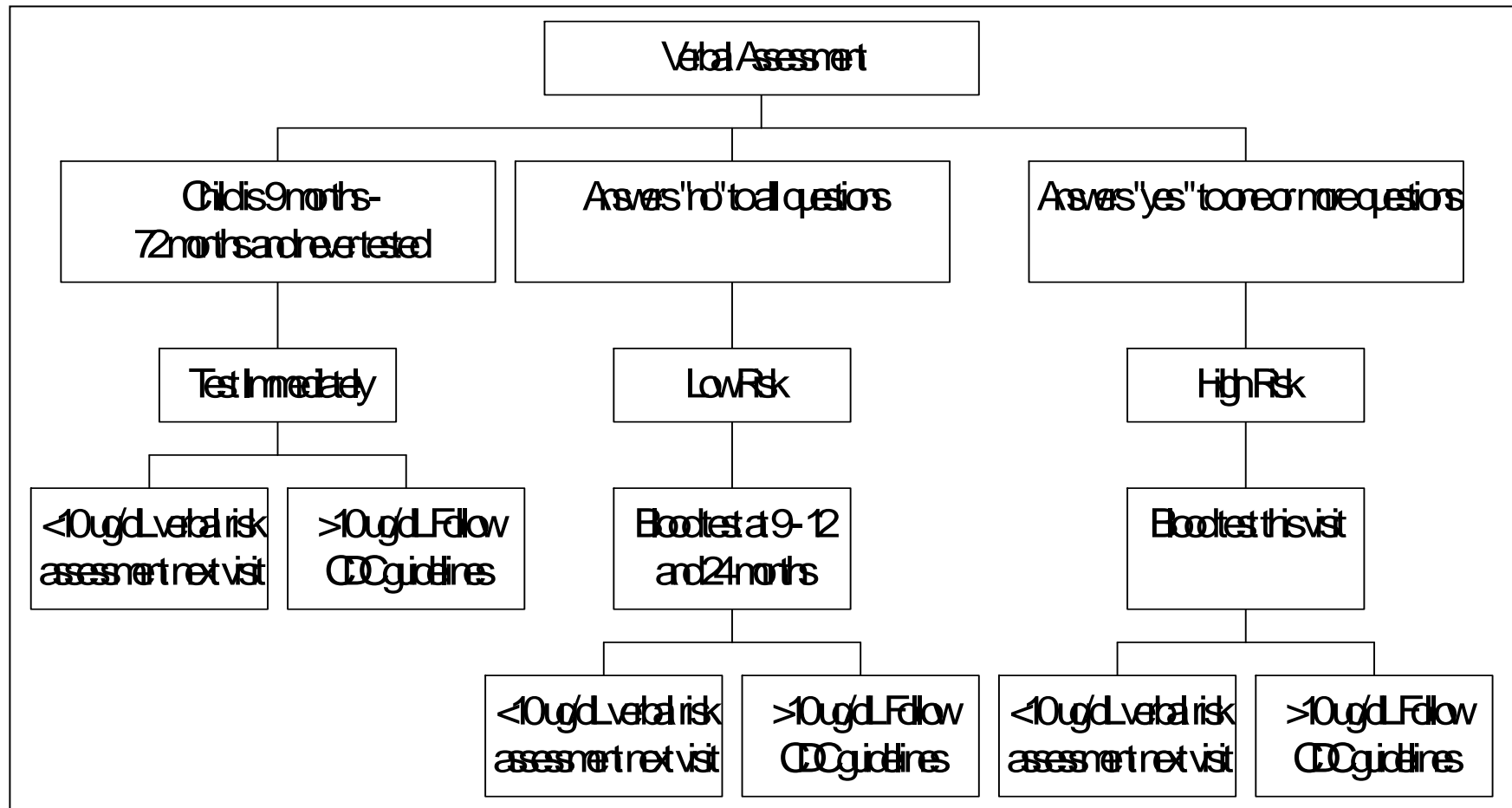
At every preventive health visit all children 6 months to 6 years of age are evaluated, using the questions on the “Verbal “Risk Assessment for Lead Poisoning” to determine their exposure to and risk of lead poisoning.

If the verbal risk assessment is negative at each visit, a blood lead level test should be routinely done from 9–12 months and at 24 months of age. A positive answer to any question on the risk assessment will warrant a blood test for lead poisoning beyond the routine periodicity schedule. Refer to Lead Screening Chart for detailed information.

Recommendations on the following page describe actions to take with regard to classification I-V and the blood lead level associated with each class. Refer to the Lead Classification Chart for detailed information about blood lead levels and assessment, interventions and follow-up for each classification.

Appendix M: Lead Screening Flow Chart

Lead Screening Protocol – Ages 6 months to < 72 months



Appendix N: CDC Summary Recommendations for Educational Interventions for Caregivers

General Considerations

- Tailor educational interventions to each child and caregiver.
- Repeat educational interventions as needed.

Environmental Interventions

- Provide information about potential sources of lead identified during environmental investigations.
- Explain that lead abatement should be conducted by certified professionals.
- Discuss and demonstrate the following methods that caregivers can use to reduce their child's lead exposure:
 - Create barriers between living/play areas and lead sources.
 - Regularly wash children's hands and toys.
 - Regularly wet mop floors and wet wipe window components.
 - Vacuum carpeted areas before wet mopping floors; cover carpeted floors with throw rugs.
 - Leave shoes at the door. Use entryway mats.
 - Prevent children from playing in soil. If possible, provide sandboxes.
 - Consider relocation if lead contamination is extensive and not easily remediable.
- Discuss with caregivers potential water hazards only if appropriate.
 - Do not cook with or allow children to drink hot tap water.
 - Run the tap water cold for 1-2 minutes in the morning and then fill a pitcher with the water for drinking, cooking, and formula preparation.
 - Use bottled water if drinking water is contaminated.

Nutritional Interventions

- Discuss dietary interventions
- Encourage caregivers to provide children with foods rich in absorbable iron, vitamin C, and calcium.

Medical Care

- Discuss the importance of recommended medical follow-up, including the importance of notifying the Case Manager if the family moves.
- Review the nature of and risks associated with elevated blood lead levels (EBLLs).

Centers for Disease Control and Prevention. Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention. Atlanta: CDC; 2002

Appendix O: PRENATAL LEAD SCREENING GUIDELINES

A. Risks of lead exposure in pregnancy

Lead is a neurotoxic element that can cause devastating fetal effects. Lead crosses the placental barrier and the developing nervous system of the fetus is particularly vulnerable to lead toxicity. Some studies have shown that blood lead levels as low as 15ug/dL may result in adverse pregnancy outcomes including spontaneous abortion, premature birth, stillbirth, birth defects, and decreased intellect and/or behavior problems in the child.

A special concern for pregnant women is that past bone lead accumulation may be released into the blood during pregnancy. Studies have also shown that males exposed to lead may have decreased sperm counts and/or abnormal sperm morphology.

B. Patient assessment and education

All prenatal patients shall be assessed for potential lead poisoning at the initial prenatal work-up visit and be given the PAM-ACH-25. The need for blood testing is based on a yes response to one or more lead risk assessment questions. The questions to determine risk status have been incorporated into the patient handout “What is Lead?” (PAM-ACH-25) that is available on the DPH intranet web site.

C. Indications for blood testing

If a prenatal patient answers yes to one or more of the four risk assessment questions at the initial visit, a venous blood specimen should be drawn the same day. A purple top tube should be drawn immediately and sent to the Jefferson County Health Department Laboratory, 400 East Gray Street, Louisville, Kentucky 40202. This blood test should be drawn at the same time as the other prenatal lab work. The properly completed sample submission form (provided by the Jefferson County Lab) shall accompany every sample. The laboratory will report the results directly to the submitting health department. In addition, the laboratory will report all results indicative of lead poisoning to the State Division of Epidemiology.

D. Results of screening test:

Level less than 10 ug/dL



No known risk

Level between 10–29 ug/dL
(Lead Exposure)



A. Prenatal home visit

and counseling to reduce or eliminate known risk factors

B. Notify delivering physician of results and repeat blood

Level 30ug/dL or greater
(Lead Poisoning)



A. Prenatal home visit

and counseling to reduce or eliminate known risk factors

B. Notify delivering physician test of test results and consult

Appendix O: Continued

Specimen in 8 weeks

with physician familiar with the
management of adult lead

poisoning

E. Documentation:

Documentation in the medical record should be brief such as “PAM-ACH-25 provided and discussed with no risk factors found” or “PAM-ACH-25 provided and discussed and blood to lab for screening due to positive risk factors.”

Environmental and Clinical Health should work together on all prenatal cases of lead exposure or lead poisoning. Time to correct the problem is very limited and critical in preventing poor pregnancy outcomes.

Pregnant women with lead levels above 10 ug/dl should be advised that any children in the household (ages 6 months–6 years) should be referred to the LHD’s Well-Child/EPSTD^T program or to their primary care provider for lead screening and/or testing. (See Lead Section)

* **Prenatal Section of PHPR**